

April 1, 1950

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arctic performance

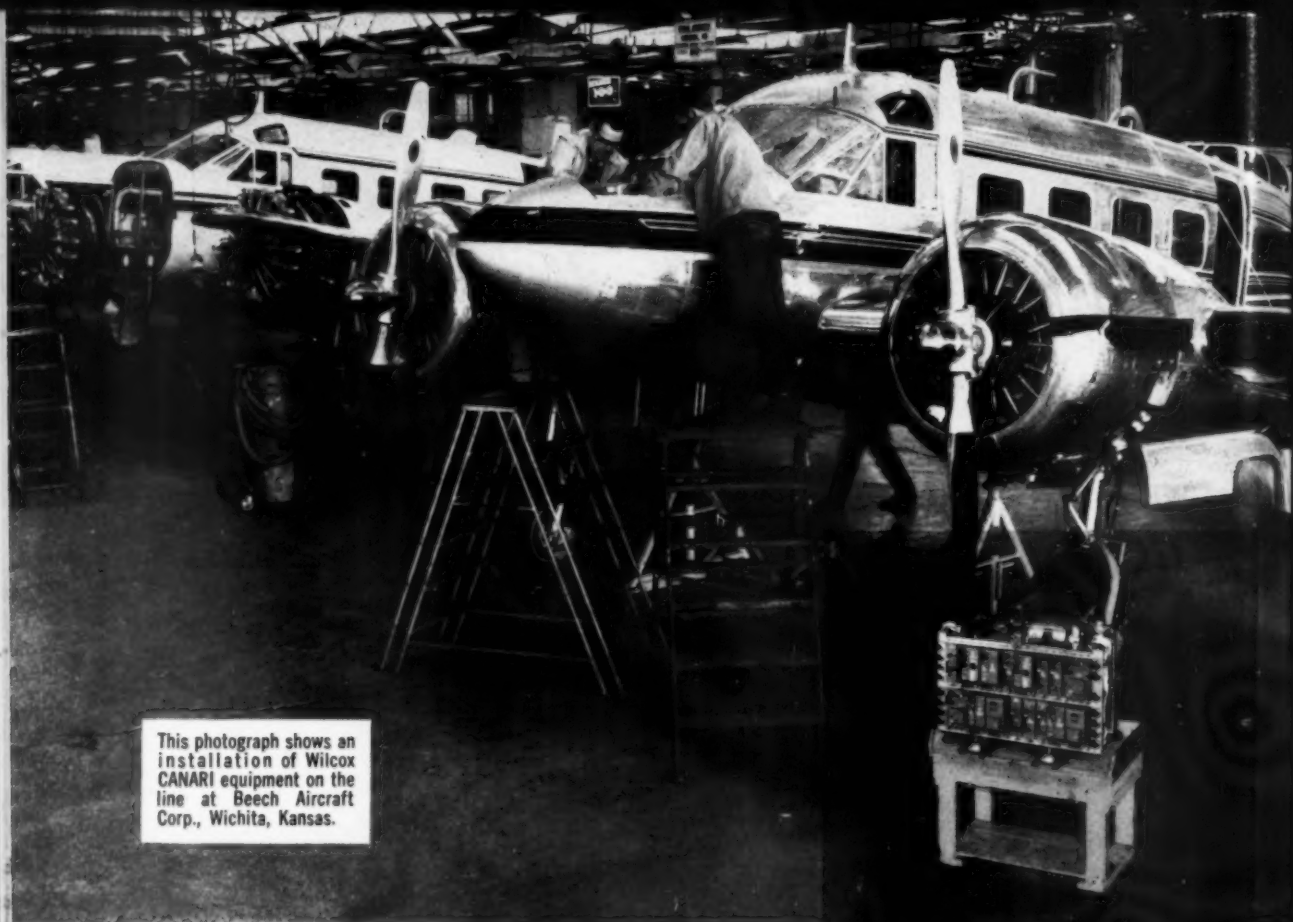
Men of the RCAF—aircrew and groundcrew alike—
have learned to work with the demanding elements of the Arctic.
Their resourcefulness and courage are our greatest assets
in maintaining our wide-ranging defence system.



AVRO AIRCRAFT LIMITED

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When you select and specify a Wilcox CANARI system for your communications and navigation equipment, it can be installed at the factory as your craft comes down the assembly line. There's no waiting for installation of this vital equipment after delivery of your plane. Your plane is ready to fly away when it comes off the line . . . ready to go wherever you want to go in any type of weather.

With a factory installed Wilcox CANARI system you eliminate the problem of choosing individual pieces of equipment and coordinating them. Your Wilcox CANARI equipment is system engineered for the aircraft of your choice and built right in at the factory. There's no worry about selection and installation of equipment.

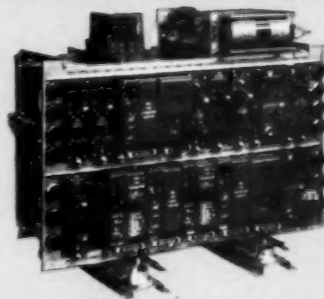
With a factory installed Wilcox CANARI system there's no wasted space . . . no wasted weight. Wilcox CANARI equipment is the smallest size, lightest weight equipment in its class on the market today. There's no wasted space or weight.

Consider these major advantages of factory installed Wilcox CANARI equipment when purchasing your business aircraft.

Also, remember Wilcox CANARI equipment is CAA Certified and has been proved in use in hundreds of airline and business aircraft. It's pretested, in the rack, at Wilcox before it is shipped to the factory or dealer. It's reliable . . . dependable . . . easily maintained. It's produced by the pioneers of light-weight, small size airborne equipment. It's the equipment you've been waiting for . . . it's Wilcox.

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No Worry
No Waste . . .
with Factory Installed
wilcox CANARI
Equipment in Your
Business Aircraft**



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ELECTRIC COMPANY, INC.
Fourteenth & Chestnut St.
Kansas City 27, Mo., U. S. A.

Which Anti-Skid System Will Serve You Best?

Before you decide, read this

Tire skidding in aircraft landings can now be prevented by two superbly efficient warning systems—developments of Wheel and Brake Engineering of the Aviation Products Division of Goodyear. Each offers certain definite advantages, both can be depended on to minimize the haz-

ards inherent in today's high-speed landings. Why not look at the facts below, then let us help you decide which system better suits your operating conditions. For complete information, just write: Goodyear, Aviation Products Division P-1713, Akron 16, Ohio, or Los Angeles 54, California.

Skid Warning System*†



A plunger thumps the pilot's foot.

How it works—The moment rotation of any tire begins to drop abnormally, a plunger projecting through the brake pedal involved actually thumps the pilot's foot, warning him to ease up on brake pressure, eliminating skids and tire damage.

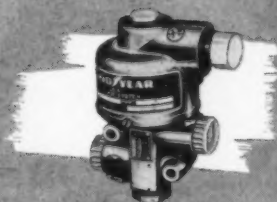
Advantages—Lightweight, low cost, completely independent of and simple to install with any braking system, requires minimum certification and flight check-out time, includes simple switch check-out system, pilot retains control.

*Now CAA-approved for Douglas DC-7B series aircraft.

Others to follow soon.

†Patents pending

Fully automatic Anti-Skid System



A solenoid valve releases brake pressure.

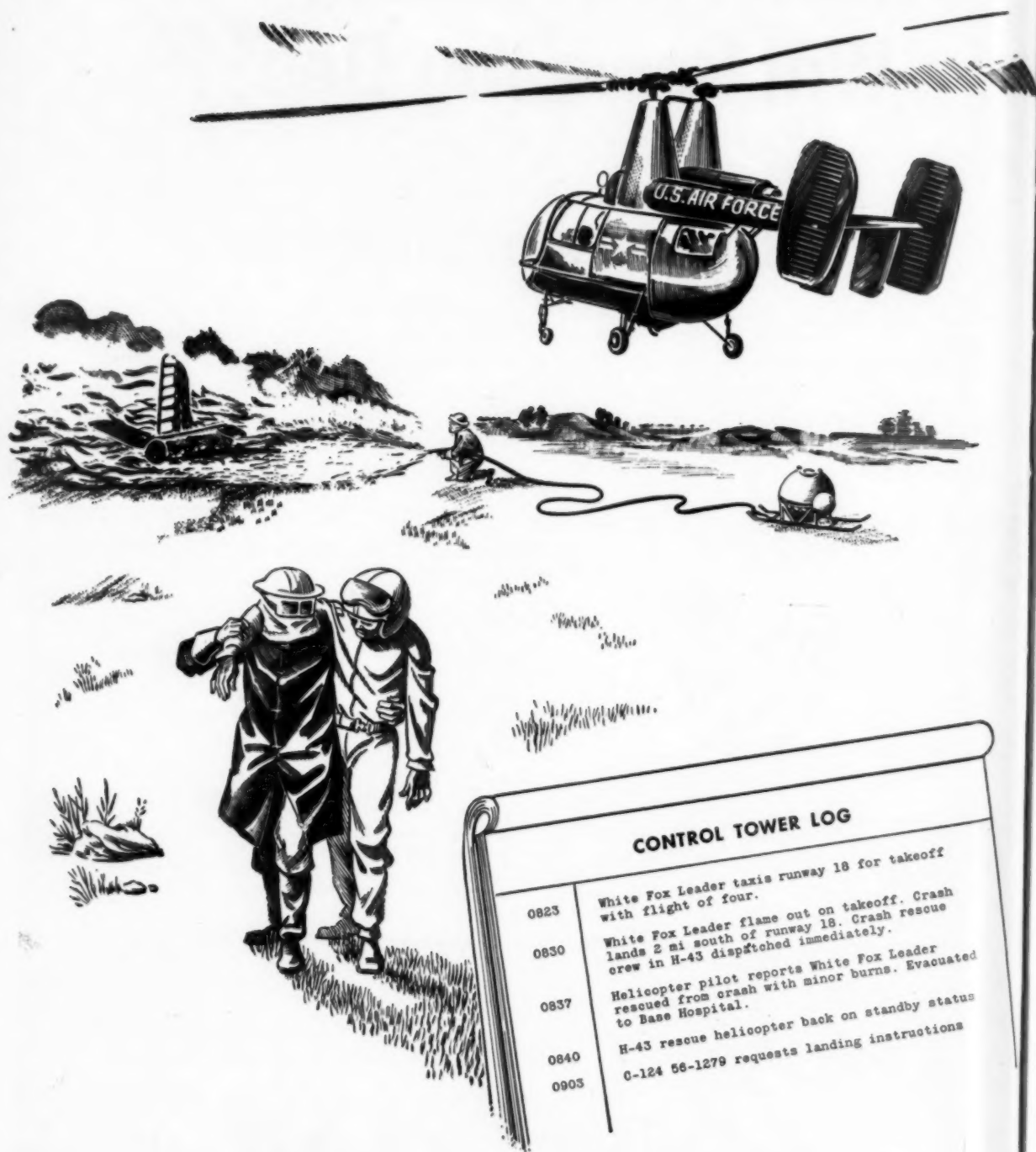
How it works—Automatically releases the brake pressure on the skidding tire through the action of a solenoid valve. When the skid has been stopped, the valve automatically allows braking to recommence.

Advantages—Complete and automatic protection against all skid and wheel lockup conditions. Eliminates flat-spotted or blown tires. Extremely rapid response, resulting in consistently short stopping distances for any given runway condition. Sizable number of field installations have proved years of trouble-free service.

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BLOOMFIELD, CONNECTICUT

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KEITH SAUNDERS, News Analysis

ARAX ODABASHIAN, Librarian

M. MICHAEL CERICK, Advertising Sales Manager

EDITORIAL OFFICES: 1001 Vermont Ave., N.W., Washington 5, D.C. U.S.A. Phone: Sterling 3-4500. Cable AMERAV. Advertising Offices: 17 East 48th Street, New York 17, N. Y., U.S.A. Phone: Plaza 3-1100.

BUSINESS OFFICE: Lawrence L. Brettner, Circulation Director; Geneva C. Kinnard, Circulation Fulfillment Manager; Ellen P. Ceakley, Advertising Service Manager.

REGIONAL OFFICE: New York City: 17 East 48th St., New York 17, N. Y., M. Michael Cerick, advertising sales manager; Robert Weston and Frederick W. Pratt, regional advertising managers. Phone: Plaza 3-1100. West Coast: 8943 Wilshire Boulevard, Beverly Hills, Calif., Fred S. Hunter, manager; John Ball, Jr., regional advertising manager. Phone: Bradshaw 2-6561, and Crestview 6-6605. Canada: Allin Associates, 12 Richmond Street East, Toronto 1, Ontario. Phone: Empire 4-2001. Allin Associates, 1487 Mountain Street, Suite 4, Montreal, Quebec. Chicago: 139 N. Clark St., Chicago 2, Ill. Laurie S. Seward, regional advertising manager. Phone Central 6-5804. Detroit: 201 Stephenson Bldg., Detroit 2, Mich. Phone Trinity 5-2555. Kenneth J. Wells, regional advertising manager. Cleveland: 244 Huron Bldg., 1422 Euclid Avenue, Cleveland 15, Ohio. Phone Prospect 1-2420. James C. Brettman, regional advertising manager. London: The AAP Company, 17 Drayton Road, Boreham Wood, Hertfordshire, England. Phone ELStree 2688. Cable Address: STEVAIR. London. Paris: Jean-Marie Riche, 11 Rue Condorcet, Paris (9e). Phone TRU 15-39. Cable Address: NEWSAIR PARIS.

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AMERICAN AVIATION

WORLD'S LARGEST AVIATION PUBLISHERS

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In this issue . . . An exclusive report on the smoldering controversy between pilots and flight engineers as to who should man the third cockpit seat in future jets and turboprops. Analyzing their sides of the story are Karl M. Ruppenthal, veteran pilot, and George R. Petty, Jr., president of Flight Engineers International Assn. For their views on this vital issue, see pages 26 and 27.

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BIG aircraft performance with small aircraft landing field capabilities — these factors make the Beechcraft L-23D the finest in Army Aviation! This new Beechcraft is **safe** too. With the propellers, engines, and low-wing structure "running interference" for the occupants in case of a forced landing, there is only **4% per cent** of the weight of the airplane above and behind them!

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The L-23D is just one of four different types of airplanes now being produced at Beechcraft. Other projects include advanced research and development into the fields of missiles and target aircraft; engineering test programs on aircraft emergency escape systems; and classified projects in the advanced fields of aerodynamics, cryogenics, thermodynamics, and aircraft range extension.

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The U.S. Owes Him a Lot

AMONG THE MEN of really high stature, integrity and courage in the Pentagon, Lt. Gen. Donald Leander Putt has always been in the front rank.

We are sorry that this brilliant USAF officer has decided to retire from the service at the early age of 53. But we can't blame him. He's had more than his share of discouragements, battles, frustrations.

But he's also had his victories. The nation owes him more than it can ever repay. Who else but General Putt would have taken the strong stand, almost alone, against the Truman Administration's decision to abandon the vital Atlas missile project some years ago? And who else but General Putt would have found a way to divert other funds to help Convair keep the Atlas study moving?

Only two years ago there were topside Pentagon directives issued to keep research funds within rigid limits imposed by the Eisenhower Administration. Who but General Putt would have had the courage to brush aside these directives and request (and obtain) additional research funds from Congress?

As deputy Chief of Air Staff (Development), General Putt has been warning for the past two years that we have an imbalance in our airpower program. He has warned that we were lagging in such vital fields as anti-missile missiles, long-range all-weather interceptors, the important X-15 project and the development of adequate detection systems.

Few men in the Pentagon have understood for such a long period the significance of the Soviet Union's space program. Few have been so disturbed at our own lagging studies and projects. General Putt has had the courage of his convictions. He is a dedicated man. He has spoken up clearly and forcefully. His voice will be greatly missed in the Pentagon where it has been effective against great and discouraging odds.

Our "People's Factories"

It is quite apparent that the United States military establishment feels that the Soviet Union has evolved a way of life worth emulating. The Air Force and the Navy, especially, have moved rapidly into the Soviet pattern of state socialism with a network of "People's Factories" and a "People's Airline" (called MATS) and almost any day we expect the Order of the Red Star to be given to some staunchly patriotic U.S. general or admiral for having out-performed Rumania or Czechoslovakia in following the Moscow formula for success.

All this *must* be so, because the facts are there to prove the belief of U.S. military in the Soviet way of doing things. It used to be in pre-socialist days that USAF and Navy let out maintenance and overhaul work to the privately-owned aircraft maintenance industry. But today only 3% of the \$1.5 billions which Congress allocates for maintenance is offered out competitively to private industry.

When Congress ordered a 7% cut in the fiscal 1958 budget for aircraft maintenance, the military did just fine. It cut its own "People's Factories" 1% and cut private industry 56%. And whether or not the military services realize what they are doing, the end result is one big boost to the cause of state socialism as pioneered by the Soviet Union.

Today over 140,000 civilian skilled personnel are employed in 20 People's Factories, known as Overhaul and Repair Depots. Not bad empire-building. After all, out of the \$40 billion defense appropriation a whopping \$7 billion goes for maintaining our weapons once they come into inventory. A commissar's paradise! A carnival for state socialism! Bureaucracy in its finest flowering! And all done for the glory of the People's Democracy, U.S. Branch.

Well, as we often say, the U.S.A. can take care of its enemies in due style, but Lord save us from those carrying our flag at home but who undermine the very system which made this country great. The military who have pushed their People's Factories into big socialistic business following the lines of Lenin and Stalin had better do some soul-searching before it's too late.

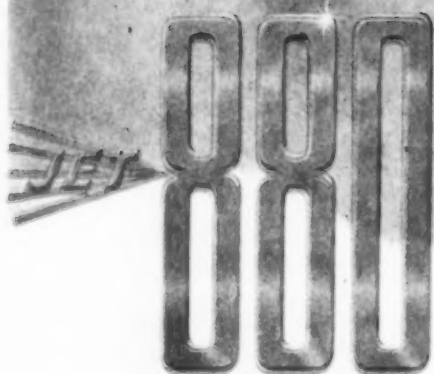
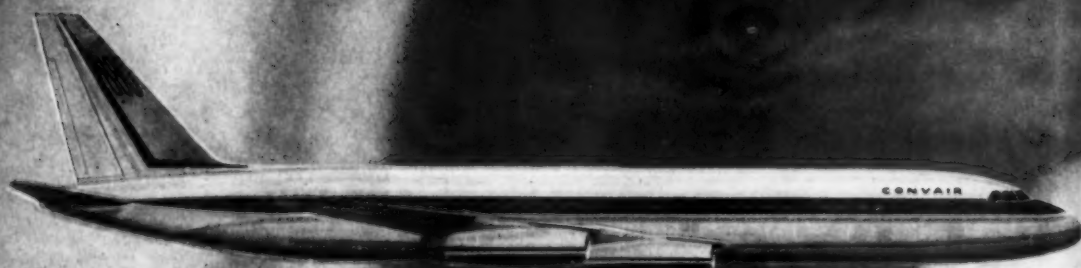
Correction Please

We went too far to starboard on this page in the last (March 24) issue in describing the scope of the legislative plans for a new Federal Aviation Agency.

We said the Civil Aeronautics Board would be absorbed into the new proposed agency, along with CAA and many other civil aviation activities. This, it turns out, is not the case. The CAB will remain as an independent regulatory agency for air transportation, responsive to Congress, while CAA will be included in the new agency which will be more responsive to the executive branch of government.

This is an important distinction. Certain safety functions of CAB may well be transferred, and the new agency would establish civil aviation policy generally, but the five-man CAB would remain quite independent.

Wayne W. Parrish



Among airlines to first offer Convair
Jet 880 service will be

TWA, DELTA,
Transcontinental, S.A. (Argentina),
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With superior speed, dramatically stylized interiors, two-abreast seating and the ultimate in engineering, the luxurious *Convair Jet 880* leads the way into the jet-travel era. To the passenger this affords even greater saving of travel time, less travel fatigue, a minimum of possible en route delays, and complete peace of mind and comfort. These dynamic passenger appeals assure untold *travel treasures in the new jet age!*

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AIRTRENDS

Hottest topic in engine development circles: Pratt & Whitney and General Electric jockeying for position in military and civil jet engine market that may develop from their turbofan projects. Both are using a new approach to turbofan, P&W with a modification of its J57 reported to be already running, GE with its X-220 derivative of the J79.

Big selling points of both are that they can obtain the advantages of a by-pass engine by relatively simple modifications of existing engines. Both are attempting to prove out their respective theories at this time.

Meanwhile, military position remains one of "wait and see." If manufacturers come through, military orders will be there. If not, no development money is lost.

Even more attentive to projects, however, are civil airlines. American Airlines, for example, now nearing the decision point on the Boeing 720 versus Convair 880, reportedly will specify retrofit to turbofans when the engines become available.

Fears are growing that more economy moves will be taken by Pentagon unless a further increase in debt ceiling is enacted by Congress before recess. Reason: expenditures are now expected to exceed targets. Navy already faces proposals to cut back on aircraft in effort to bolster antisubmarine warfare developments.

Saving factor is that cutbacks, if any, will be designed to avoid further layoffs which have already hit aircraft producing areas and are expected by Labor Dept. to hit Los Angeles, San Diego and Ft. Worth, among other places.

Biggest project of them all, Air Force's boost-glide "Dynasoar" project is nearing decision. USAF Source Selection Board is expected to file reports with the Air Staff about April 21 or 22, at same time recommendations are submitted on off-the-shelf utility jet (see page 51).

Defense Dept. reorganization plan will face rough sledding in Congress. Odds favor almost certain veto if plan attempts to centralize more power in Secretary of Defense or materially strengthen the hand of Chairman of Joint Chiefs of Staff. A majority of either House could effectively scuttle the plans. Result: all indications are final reorganization will be mild.

Next big fight looming on the horizon will be over Renegotiation Act extension, with industry taking position that excess profits, if any, can be mopped up in price redetermination procedures at Pentagon. Long lead-time between earnings and answers from Renegotiation Board, industry makes clear, are virtually impossible to live with under current conditions.

Watch for Pentagon proposals for extension of important progress payment authority. Nothing has developed on this yet, but Defense Dept. is reportedly working on a formula to submit to Congress.

Until now, military authority to negotiate contracts and issue progress payments are tied up in Title II of War Powers Act. But Senate Judiciary Committee bristles at endorsing "emergency" powers again, wants a clarification of this procurement area.

All signs point to quick Congressional action on new airport aid bills. Reasons: expanded facilities are a must in the face of needs for jet operations and enactment at this time would offer another source of employment stimulation well dispersed throughout the country.

As measures stand, S.3502, introduced by Sen. A. S. Monroney (D-Okla.) jumps annual Federal aid from \$63 million to \$100 million, extends program to fiscal '63. Companion bill, H.R. 11566, by Thor C. Tollefson (R-Wash.), is identical in scope, would speed House passage if Monroney measure clears Senate.

Only big area of controversy: exclusion of parking lots, bars, cafes or other space for rental or lease to concessionaires as an allowable project cost. Both measures increase allowable funds for fiscal '59 by \$75 million to spur modernization of large terminals limited under present program.

INDUSTRY At Deadline

Employment countdown: 117,500 drop!

Aircraft industry employment dropped from a high of 891,500 in January 1957 to a little more than 774,000 in January 1958 and is still going down, according to the Bureau of Labor Statistics.

BLS figures on production workers are even more indicative of the trend. In January 1957 there were slightly more than 595,000 production workers

reducing employment fast enough, all contributed to the sharp reduction in payroll.

Air Force's shopping list was cut from 1,515 aircraft to something less than 1,000 and the Navy's from 1,212 to between 700 and 800. Contract maintenance awards also were delayed as the Pentagon's effort became geared to a \$19 billion spending limit for

Aircraft industry employment (in thousands)

	All Employees			Production Workers		
	Jan. 58	Dec. 57	Jan. 57	Jan. 58	Dec. 57	Jan. 57
Aircraft	469.0	475.4	546.8	303.9	307.1	362.6
Engines & parts	151.3	155.3	181.0	90.3	92.9	116.0
Propellers & parts	20.7	20.3	19.7	14.3	13.9	13.3
Other parts & equipment	133.2	134.8	144.0	90.4	91.9	103.3
Total	774.2	785.8	891.5	498.9	505.8	595.2

in the aircraft industry. The corresponding statistic this year is 499,000.

The 117,500 reduction in force is the net result of the economy wave starting in mid-1957 when former Defense Secretary Charles E. Wilson ordered Air Force, Navy and Army to live within rigid expenditure ceilings.

Subsequent contract stretchouts, limitations on overtime, reduction in progress payments and, finally, Pentagon complaints that industry was not

the six months ending Dec. 31.

And contrary to general belief, aircraft employment trends have not changed since Russian launching of Sputnik. BLS figures show industry employment continued to dip from December '57 to January '58 and are expected to go even lower. Its most recent report from areas accounting for about 90% of the U.S. total aircraft employment indicates a slight additional job decline until mid-May.

All but three states share B-52 dollars

Production of additional USAF B-52 bombers, now being considered in supplemental appropriations for fiscal 1959, would result in new defense business in 45 out of the 48 states, according to Boeing estimates.

The company's Seattle Division, which produced all early models of the eight-jet bomber, showed sub-contractors in all but three states as of July 1, 1957. Missing were Montana, North Dakota and Mississippi.

Boeing officials told AMERICAN AVIATION that some 67.4% of B-52G and 57% of B-52F production is sub-contracted. Of this 17.5% is committed to small business (less than 500 employees) and 82.5% goes elsewhere.

As of July 1, Boeing listed some 2,558 small business suppliers and 909 large suppliers on these projects.

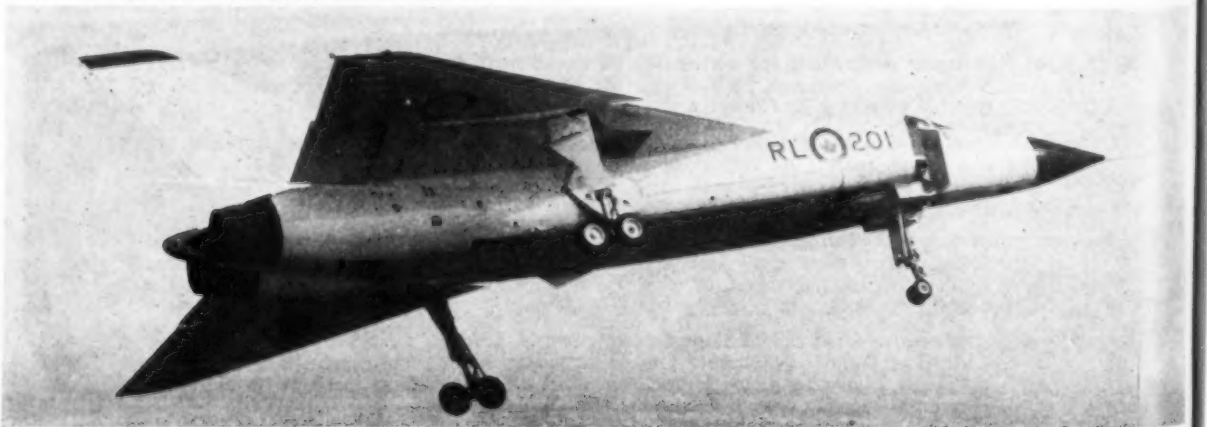
With the addition of Boeing-Wichita B-52 activity to Boeing's contract dispersal picture, North Dakota becomes the only state not on the receiving end of some business.

AMB names Atlantic City for ATC research center

Airways Modernization Board at presstime unanimously selected Atlantic City Naval Air Station as the site for its National Aviation Facilities Experimental Center. AMB chairman E. R. Quesada said he expects to start operations by July 1 following negotiations with Atlantic City officials and other interested agencies.

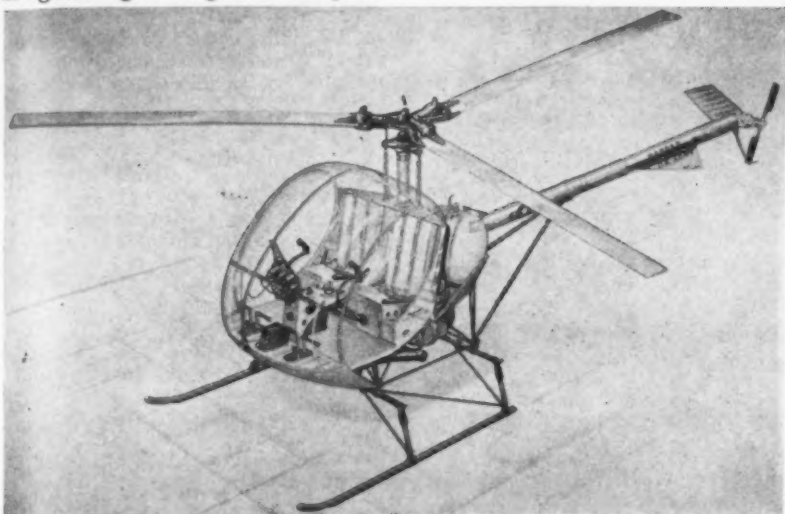
Staffing for the center for fiscal '59 calls for 225 technicians including scientists, engineers and military representatives. AMB studied some 1,800 airport sites leading to the Atlantic City choice.

Avro's big delta-wing fighter takes to the air



FIRST FLIGHT of Avro Aircraft Ltd.'s CF-105 delta-wing fighter took place recently at Malton, Ontario, with the company's chief experimental pilot, Jan Zurkowski, at the controls. Designed for speeds considerably in excess of 1,000 mph, this pre-production Arrow is powered by two 15,000-lbs. thrust Pratt & Whitney afterburning J75 turbojets. Production aircraft will use two Orenda Iroquois engines each developing 30,000 lbs. thrust with afterburner. The Iroquois will not be used during the initial airframe development flight test program.

Hughes lightweight helicopter



WORK HAS STARTED at Culver City on five Hughes Model 269A helicopters ordered by Army. Designed for top speed of 90 mph and cruise range of 150 miles, takeoff weight of Model 269A will be 1,550 lbs. Engine is 4-cylinder, aircooled, 180-hp Lycoming. Army has ordered five helicopters of the same category from Brantly Helicopter Corp., Philadelphia. Deliveries of both makes are expected to start around the end of this year when evaluation by Army and Air Force pilots will take place at Ft. Rucker and Edwards AFB.

How AMB will pick contractors

Electronics firms looking to future business from Airways Modernization Board may have only themselves to blame if they don't hit pay dirt.

Under a new approach to deciding which company will develop which piece of the future ATC system, Airways Modernization Board chairman Elwood R. Quesada feels he has found the right formula for the most judicious choice, still providing the best protection and best dollar value for Uncle Sam.

First test for the new contractor evaluation came in the recent award of a \$4.3 million contract to General Precision Laboratory, Inc. of Pleasantville, N.Y., to develop semi-automatic ATC equipment. Quesada says the same process with some refinements will be used by AMB in underwriting millions of dollars more in contracts for development of the nation's 1970 ATC system.

Key factors being considered by AMB in weighing manufacturer proposals are (1) technical features, (2) operational capabilities, (3) company performance and (4) money. In evaluating a given program, Quesada removes all cost information relating to specific proposals and turns them over to AMB's staff for evaluation.

From this point on it's a question of what score a manufacturer registers as to whether he lands the business.

In the competition won by GPL, AMB used a team of six consultants to evaluate the technical side of each proposal. As Quesada describes them, these consultants represent the "best

brains" in the particular field a proposal deals with. They may come from AMB's staff or from outside.

Using a system of "scoring" various technical aspects (with different "weights" given the relative importance of each feature), the consultants arrive at a technical score for each manufacturer.

For example, each proposed system will be scored for such features as technical understanding of the problem, technical feasibility, completeness, effect of a component failure and reliability.

The same process is followed by six operations consultants secured by Quesada to judge this phase of a project. Ease of transition from present system and capacity compared to ATC system today are typical factors weighed by this group.

In the meantime, contracting specialists review and score each competitor on his ability to handle the project, his know-how to develop it and his past performance in government contracts, particularly with respect to delivering the goods on time and at the contract price.

With all three factors scored for each competitor, Quesada adds up the total to determine *not who wins* but what company AMB will *negotiate* with.

At no point in the process does AMB choose a contractor for a project and negotiate after notifying him he has been selected. If AMB can't come to terms with the high scorer in the competition, that firm is simply dropped

and the next highest becomes the new negotiator.

The system also gives AMB's staff the flexibility to select features from various proposals and impose them on the firm they pick for negotiation. In such instances, Quesada points out, the winning contractor will be bound to do business with the firm proposing a particular feature in carrying out that phase of a project.

As an example, in the award won by GPL, features were extracted from other proposals and about three or four firms will share some portion of that project.

New Defense ruling eases restrictions on overtime

Rules governing overtime on Defense contracts are eased somewhat by new armed services procurement regulation approved by Deputy Defense Secretary Donald A. Quarles. The rules do not apply to ballistic missiles.

Generally, the new section follows the policy laid down in directives issued last summer by the Pentagon barring overtime, extra-pay shifts or multi-shifts unless authorized. However, only premium pay or shift premiums will not be considered an allowable cost, unless specifically authorized. This means that pay for more than the standard shift will be reimbursed by the government at straight time only.

To get authorization for reimbursement of overtime or shift premiums, it will be necessary to obtain approval from a service secretary or his designee for one of the following reasons: (1) to meet delivery or performance schedules when such schedules are already extended to the maximum consistent with essential military objectives; (2) to make up for delays beyond the control and without the fault or negligence of the contractor; (3) to eliminate foreseeable production bottlenecks of an extended nature which cannot be eliminated in any other way.

AAP expands in Europe

American Aviation Publications has expanded its editorial and business activities in Europe with the opening of a central office in Geneva headed by European Director Anthony Vandyk.

Address of the new office is 10 Rue Grenus, Geneva, Switzerland. Phone is 321044 and cable address AMERAV GENEVA.

Before assuming the European post, Vandyk spent more than five years in AAP's Washington headquarters as international editor. He will continue to fill this assignment for AMERICAN AVIATION magazine in addition to his duties as general representative for all AAP publications in Europe.

AF's new weapon support system

A new weapon support management concept has been adopted by the Air Force in an effort to provide rapid and positive response to supply demands of tactical units, wherever located. By using this concept, AF also hopes to provide precise management of material and economy in inventory investment.

Under this thesis, responsibility for support management of first-line weapons is vested in a single Air Materiel Area. The support managers

are authorized to keep a complete range of supply items required to support assigned weapon systems. This includes ground support equipment. These stocks will usually be stored at and distributed from assigned storage sites geographically located near tactical units.

The new concept is spelled out in AFM 67-1, Volume XX. Assignment of first line aircraft and air-launched missiles is as follows:

Aircraft	Air Materiel Area	Weapon System Code	Storage Site Location
B-52	OCAMA	89	WRAMA, OOAMA San Antonio AFS Convair (Ft. Worth)
B-58	SAAMA	90	SBAMA
B-66	SBAMA	35	SBAMA
KC-135	OCAMA	16	OCAMA, Memphis
F-100	SMAMA	22	SMAMA, Memphis
F-101	OOAMA	23	OOAMA, Memphis
F-102	SAAMA	24	SAAMA, OOAMA, MAAMA
F-104	SMAMA	25	SMAMA, Memphis
F-105	MOAMA	26	MOAMA, Maywood, Calif.
F-106	SAAMA	27	SAAMA, OOAMA, MAAMA
B-57	WRAMA	34	WRAMA
C-123	MAAMA	54	MAAMA
C-130	SMAMA	56	SMAMA, Gadsden, Ala.
C-133	SBAMA	59	SBAMA
GAR-1, 2, 3, 4	MAAMA	95	Hughes (Tucson) MAAMA
GAR-8	MAAMA	98	MAAMA
GAM-63	OCAMA	87	Bell (Tonawanda, N.Y.)
GAM-72	OCAMA	91	McDonnell (St. Louis)

MAAMA—Middletown, Pa.; MOAMA—Mobile, Ala.; OCAMA—Oklahoma City; OOAMA—Ogden, Utah; SAAMA—San Antonio; SBAMA—San Bernardino; SMAMA—Sacramento; WRAMA—Warner Robins, Ga.

NOTE: GAR-1, 2, 3, 4 are Hughes Falcon missiles, GAR-8 is Philco Sidewinder, GAM-63 is Bell Rascal, and GAM-27 is McDonnell Green Quail.

Fast start for staff member



PILOT George V. Hart (left), who recently joined AMERICAN AVIATION's staff as technical editor, chats with flying safety officer, Capt. Wally Nielson, prior to flight in Cessna T-37A twin-jet trainer at Bainbridge, Ga. Hart is a former RAF jet pilot and Wright Aeronautical engineer at Edwards AFB. He was a sales rep for Air Logistics Corp. before joining AMERICAN AVIATION.

BRIEFS

California Div. of Lockheed has received a contract valued at about \$9 million for 10 P2V-7 patrol bombers for assignment to the French Navy under the military assistance program. Contract is 26th placed by the U.S. Navy since beginning of Neptune production in 1944.

Rohr Aircraft Corp. is working on a jet engine sound-suppressor-thrust-reverser and is running tests on a 1/8-in. scale model in a test stand at Chula Vista. Results show great promise, company officials say.

Boeing Airplane Co. has set its Wichita Division retooling costs for B-52G construction at \$53 million. Included are three skin mills, three profile mills, and two automatic riveters, all to be controlled automatically by electronic tape.

Convair, Lewis Flight Propulsion Laboratory and Northrop are winners of the National Safety Council's 1957 Aeronautical Section Safety Contest. NSC figures show an overall increase in accident frequency of 9% over 1956, with 60 participating firms completing 993,812,000 total man-hours.

AC Spark Plug Div. General Motors Corp., has received a \$2,246,822 contract for aircraft spark plugs.

Edwards AFB will soon begin operation of a new jet engine test facility costing more than \$4 million. The cell-type unit can handle jet engines up to 50,000 lbs. thrust and turboprop engines to 25,000 hp. Cell will be available to AF and contractors.

Lear, Inc., has received a \$4,890,610 contract for gyroscope indicators and shock mounts for F11F-1 aircraft.

Philco Corp. has been awarded a \$1,751,187 contract for AC&W on-site maintenance for Eastern and Western Air Defense Forces.

Hughes Aircraft Co. has a \$1,118,965 contract for a joint USAF/Hughes/Convair F-106A/B armament evaluation program.

Curtiss-Wright Propeller Div. has a \$1,485,252 contract for a product improvement program for in-service aircraft using C-W propellers.

General Electric has received a \$1,130,162 contract for rate of flow transmitters for B-52F and B-52G aircraft.

Congressional Outlook

Mid-April—One-day hearing before House Armed Services Investigation Subcommittee (Hebert) to get additional Air Force views on bills to change the rules of negotiated procurement.

April 14—Senate Aviation Subcommittee to begin hearings on four-year extension of Federal Airport Act, other minor airport bills.

April 15-18—Senate Small Business Procurement Subcommittee to take testimony on Defense Dept. procurement procedures involving smaller firms.

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CONVAIR 340 or 440 RADAR NOSE is part of *AiResearch* conversion which includes radio, autopilot and new instrumentation.



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APRIL 7, 1958

Circle No. 102 on Reader Service Card.

13



SPOTLIGHT

American Airlines has made its decision on jet fuels in favor of kerosene and recently signed contracts with a number of fuel suppliers for its nationwide route requirements. AA is one of about 10 major U.S. airlines favoring kerosene for jets. A minority of carriers, reportedly including Eastern, still favors JP-4 military fuel, primarily because of its ready availability.

Pratt & Whitney is marketing a competitor to General Electric's J85 and Fairchild's J83 in the small jet class. Engine carries commercial designation and is rated at 2,900 lbs. thrust.

Army is evaluating nine entries in its 250-shp turboshaft engine design competition, including two surprise contenders. Latter are Thompson Products, a newcomer, and a joint effort by Curtiss-Wright and AiResearch. Others are Allison, Boeing, Chrysler, Continental, General Electric, Lycoming and Solar.

About 200 more B-52Gs will be built by Boeing as result of White House decision to provide AF more funds for program. This means orders for long lead-time components will be placed by Boeing almost immediately after proposal gets congressional blessing. Small business concerns say these orders will help present depressed industry quickly.

Strategic Air Command's equipment program calls for replacement of the Boeing B-47 with the Convair B-58 and intermediate-range ballistic missiles, and later to equip its B-52 wings with both the North American B-70 chemically-fueled bomber and ICBMs.

Small business is getting behind the fight to modify provisions of the patent sections of Armed Services Procurement Regulations. At issue is the Pentagon's claim to unlimited rights in data acquired during research and development contracts. Small business claims that all it has to sell is know-how and proprietary rights.

Lockheed has proposed a turboprop version of the Model 1649 Starliner to Air Force as a saucer-radome airborne early warning aircraft. This would be a takeoff on the now-shelved Navy W2V-1. Powerplants would be Allison T56s, but the airframe would be stressed to take the Allison 5,500-eshp T61. Target gross weight is 180,000 lbs.

Third Martin P6M SeaMaster has been flying, but the test schedule has slipped badly because of ice in Chesapeake Bay. Navy hopes to put the big seaplane through its paces faster once weather clears.

Where pilots get together, there is growing support for a two-seat long-range, all-weather interceptor—particularly for carrier use. Pilots argue that there is too much for one man to see and do in present versions. Problem is to find a way to design a plane that will carry two men without sacrificing current high performance characteristics. Navy hopes the McDonnell F4H will be the answer.

Competition between the services is only a part of the headache facing Defense Secretary McElroy. Even more serious is the current battle for scarce dollars within the services. As an example: advocates of destroyers and the like are attacking claims of carrier supporters for an important antisubmarine warfare role. Cynics are saying it isn't hard to understand lack of unification between services when there is no unification within the individual services themselves.

Doman Helicopters expects to have first production version of its Dalto simulator (AMERICAN AVIATION, Feb. 24, p. 16) completed by July 15. Company's development in fixed-wing pilot training, meanwhile, has attracted strong interest from airlines and several government agencies. Among U.S. airlines, most reaction has come from American, Eastern, National and Pan American, with AA going to the extreme of preparing a film on its operation.

More than 20% of Aerojet-General's total employment of 11,500 persons hold science degrees.

THE RECORD-BREAKING VISCOUNT

1953
1954
1955
1956
1957
1958

5 RECORD-BREAKING YEARS

On April 19, 1953 the commercial Jet Age was born, with the introduction by BEA of regular Viscount service between London and Paris. Today, five years and 265 Viscounts later, this great airliner has set an impressive record as a record-breaker! It has set new standards of popularity, economy, speed—and passenger comfort—everywhere. 36 airlines, and numerous governments and corporations, have ordered Viscounts. They are currently flying the air routes over every continent.

35.9% PASSENGER INCREASE FOR CAPITAL

A survey, based on C.A.B. data, reports, "Capital made the industry's most substantial strides... with an addition of 464,426,000 seat miles... is now fifth in capacity offered. Capital's gain of 492,447 passengers was far in excess of the Big Four total of 250,225 and raised Capital's percentage of the total passenger market from 7.5% to 9.5%." Based on a comparison of the first halves of 1957 v. 1956, Capital showed a passenger increase of 35.9%.



VISCOUNT LOAD FACTORS SOAR IN INDIA

In all parts of the world Viscounts continue to set new and impressive records for passenger traffic. The Indian Airlines Corporation, purchasers of a fleet of ten Viscounts, reports that load factors rose an average of 65% on all their Viscount routes.



Harold Parker, Continental's Liaison Engineer, checks one of the new Viscount 810/840 Rolls-Royce Dart 525 engines with Harry S. Beadle, Superintendent, Main Assembly at Vickers-Armstrongs' famous Weybridge plant.

MORE POWER ON LESS FUEL FOR CONTINENTAL'S NEW VISCOUNTS

"From an engineer's viewpoint, the most important advance in the new Viscount 810/840 is the new Dart 525 turbine engine", says Continental engineer Harold Parker. "It is no larger than the 510, but it gives the new Viscount a take-off rating of 1990 t.e.h.p. at 15,000 rpm and raises cruising speed to 365 mph. Design refinements have increased power and lowered fuel consumption.

"Air mass flow has been increased. The addition of third stage of turbine means a lighter loading per stage and increases overall component efficiency. The flame tubes have been improved... service life has been lengthened to 2000 hours and more. The new Viscount is the first aircraft with a full, twin-lock propeller-pitch control system.

"The plane's greater power has made

possible a take-off weight increase to 67,500 pounds—and with no adverse effects on take-off or climb performance. The ship's range is 1200 miles, or 1500 with "slipper" tanks. The airplane is designed to take advantage of the Dart 541 engines—available in 1960—which will raise the cruising speed to 400 mph."

For information, contact: Christopher Clarkson, U. S. representative, 10 Rockefeller Plaza, New York 20, N. Y.

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APRIL 7, 1958

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15

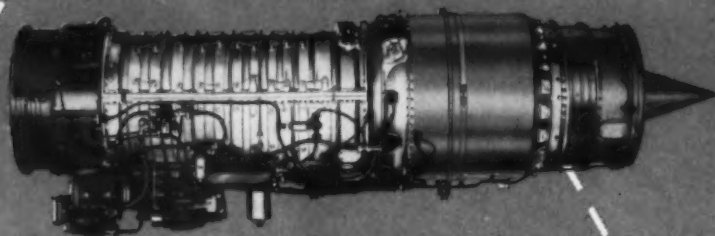


Westinghouse proves jet combustion efficiency

This plastic combustor model enables Westinghouse engineers to predetermine combustion efficiencies in turbojet designs. Observations of the flow of the colored water and air bubble mixture permit visual evaluation of air flow patterns in normally unobservable areas of engines. This test method minimizes trial and error testing with handmade metal prototypes.

Development of the latest J34 configuration for use in North American Aviation's T2J trainer proved the value of this water flow analogy test.

AMERICAN AVIATION



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rig when design modifications to permit the use of avgas and JP-4 or JP-5 were quickly and accurately evaluated. This is just one of the many complete facilities for research, design, development, testing and production of jet engines at the Aviation Gas Turbine Division, Westinghouse Electric Corporation, Box 288, Kansas City, Missouri.

J-54050

YOU CAN BE SURE ... IF IT'S **Westinghouse**

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EDWARD M. "BUD" FLESH, Senior Project Engineer of the F-101 Voodoo airplanes, has been in charge of the design and development of these Air Force fighters since their inception. Bud's abiding faith in his engineering team and in the Voodoo itself, has been a dominant influence toward the success of this project. A native son, graduate of Missouri University, he joined the McDonnell organization in 1946.

Range and reliability, two outstanding performance features of the F-101 Voodoo, were dramatically demonstrated during "Operation Sun Run," when three new transcontinental speed records were established. The world-wide acclaim of the Voodoo which followed was a fitting tribute to the many McDonnell teammates, engineers and others, who contributed their skills in creating and developing this fine airplane.

MEN OF PROJECT F-101

Growth and "opportunity" are usually synonymous. We invite career-minded engineers to compare the growth of the McDonnell engineering organization with any other firm. We will be happy to supply you with a copy of our "Annual Report" for this purpose.

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LETTERS

Appreciation

To the Editor:

MANY THANKS FOR THE COVERAGE IN MARCH 24 AMERICAN AVIATION. COULD YOU PLEASE GET US HALF A DOZEN EXTRA COPIES OF THE ISSUE? PAUL SCHRATTER, Aircraft Accessory Turbine Dept., General Electric Co., West Lynn, Mass.

Praise for Army Aviation issue

To the Editor:

A copy of your March 10 edition of AMERICAN AVIATION, which featured reports on Army Aviation, has come to our attention.

Your coverage and manner of treating this subject has received high praise from those officers who have reviewed it here.

We would appreciate your sending four additional copies of this issue for use in this office. MAJ. RICHARD J. KENNEDY, JR., Executive Officer, Headquarters, 6th U.S. Army, San Francisco.

On maintenance and overhaul

To the Editor:

This organization performs maintenance and overhaul of military aircraft and is one directly affected by the conditions outlined in your editorial on page 7 and comments on page 13 of the Feb. 24 issue relative to aircraft maintenance and overhaul.

At this point with our workload at less than one-half of that at the stage last year and having been forced to lay off approximately 1,000 employees during the Christmas season, we can only see our way clear to offer you encouragement and suggest more of the same. I might say it is not normally our practice to write letters such as this. In this case it hit home so well and since we honestly feel the current trend is not in the best interest or policy for our nation, we felt impelled to take some commendatory action.

We would also like to call your attention to H.R. 11094 now introduced into the House with the prime purpose of placing the policy you support into practice. We feel it makes good sense and urge your support.

Thanks, and let's have more of the same! ROBERT J. LANG, Vice President, Aircraft Engineering & Maintenance Co., Oakland, Calif.

In defense of military

To the Editor:

I realize that it is very popular, and safe, to attack the military on any subject, valid or not. However, your editorial in the Feb. 24 issue reaches the depths of irresponsibility and inaccuracy. The absurdity of your charges compel me to point out a few facts in defense of the U.S. Armed Forces.

1. Prior to WW II not one manufacturer of aircraft was interested in doing overhaul and repair for the Armed Forces. The Army and Navy were forced into establishing their own facilities. This was done, not as a sinister move to undermine American industry, but merely to keep military aircraft flying.

2. The Navy is not expanding O and

R facilities. They have actually been curtailed.

3. Actually private industry always charges more for O and R than does military facilities. One example: Civilian test pilots flying overhauled aircraft receive salaries averaging 25,000 dollars plus bonuses. At military overhaul facilities service test pilots receive an average salary of 7,000 dollars. This one factor alone saves the government hundreds of thousands of dollars.

4. You state that the military employ 140,000 persons at O and R facilities, implying that these personnel are members of the Armed Forces. This is a bald-faced attempt at distortion of the facts. Ninety-nine percent of the employees at Navy O and R facilities are civilians. I realize that our economy is cockeyed but does a paycheck from a private company somehow mean more than one from a government agency?

Finally, don't try to snow an old civilian about service "empire builders." From what I see private industry makes the military look like amateurs in this field. HENRY GOODWIN, Sunnyvale, Calif.

Sharp-eyed reader

To the Editor:

Referring to your advertising layout for Link Aviation, Inc., (March 10; page 91) it is interesting to note that Japan Airlines' DC-8 is flying under the American registration N 80000. KENNETH KAUFMAN, North Newton, Kan.

Cargo carrier speaks

To the Editor:

I like your top editorial in the Feb. 24 issue of AMERICAN AVIATION entitled, "The Soviet Union Has a Clear Field."

I agree with you wholeheartedly that American aircraft manufacturers are inclined to build an airplane that is good for them and the large passenger boys and the heck with the small carrier, cargo carrier and regional carrier. Because of this attitude, we at Riddle were forced to take the old C-46 and make a lady of it. It is now an excellent "T" category machine, the ideal replacement for the DC-3 and a real money-maker. However, we are near exhaustion from our efforts.

It burns me up to see the government pouring their surplus C-46s down the drain when they could be modernized as we have done with our fleet and furnished to the countries of the Middle East and Africa as you suggested in order to prevent Russia from shutting us out altogether. At least, the C-46R can get in and out of small areas with a decent load and is not so all-fired complicated that it takes a mechanical genius to maintain it.

We cargo carriers would like to have a newly engineered, three-cents-per-ton-mile operating cost, cargo plane. Unfortunately, U.S. brains, effort and money have not been channeled that way; consequently, we have of necessity had to engineer the C-46 into a Transport Category, modern airplane—and a very good one at that. So good that nothing on the horizon can compete in its operating area.

I sincerely hope that you can keep pointing out things such as you have in your editorial. If so, maybe some of our

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top-level people might become practical long enough to notice that the world has had a pretty good spin since they first started reaching for the shiny jets. **NORMAN H. GOLDEN**, vice president-engineering, Riddle Airlines, Inc., Miami, Florida.

Enjoys 'En Route' in Australia

To the Editor:

As an expatriate Australian (temporary, I hope) I have followed your ramblings around my native land with much enjoyment and considerable nostalgia. Your "En Route" report of Feb. 10 was particularly complimentary to Australian domestic aviation and I am sure it will give a lot of satisfaction to many hard working, efficient airline people "down under."

No doubt you are aware that the Australian airlines have certain advantages that are not available to their American counterparts. For example, Australian airlines are able to directly control their limousine services and operate them at no charge to the passenger because the cost has already been included in the price of the air passage. I can't imagine this system working in the United States. Secondly, the weather is better, (with a few minor exceptions), and delays are relatively less frequent.

Finally, the trunk routes are few in number, which means all of them can be adequately covered by a very efficient Air Traffic Control organization. However, there is no doubt that service is extremely good on the Australian services and this reflects credit on many people. **ROBERT S. NIELSEN**, 2623 Ashby Avenue, Berkeley, Calif.

The Stout Bushmaster

To the Editor:

Your editorial of Feb. 24, "The Soviet Union Has a Clear Field," presented a problem recognized by our corporation nearly four years ago. The realization that the world needs a light, simple, workhorse type of airplane was the complete basis for the formation of Hayden Aircraft Corp.

We have, under development, a modern revision of the old Ford Tri-Motor to be known as the "Stout Bushmaster." No airplane, before or since, has been able to match the sledgehammer toughness and reliability of the Ford Tri-Motor for dirty, rugged, day-to-day operation in rough undeveloped country where maintenance facilities and modern flying aids are unheard of.

We have purchased one of these ancient "Tin Gooses" (SAT. Serial #39) and are undergoing flight tests to prove our engineering changes. A small but highly productive engineering department is bringing all drawings up to present standards and top aerodynamicists, stress analysts and basic loads men are directing all modifications.

Our program has been delayed time and again the past few years by financial blocks. Our search for rugged individualists (a scarce item these days) with both the means and the desire to take the risks inherent in producing a plane of this type finally ended a few months ago when Ralph Williams, president, and Lloyd Saunders, secretary-treasurer of Aircraft Hydro-Forming, Inc., Gardena, Calif. threw their resources and facilities behind our efforts. Parts are now being fabricated for three airplanes and some sub-assemblies have been completed for the first

plane, with Aircraft Hydro-Forming doing the manufacturing.

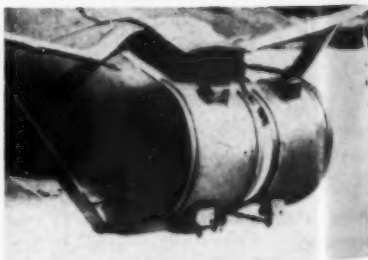
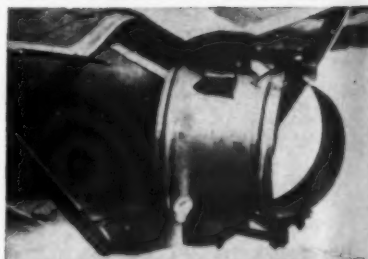
Our company is young and small and not too proud to seek all the help we can get from those interested in aircraft such as you and your fine publication. So, it is our hope that the next time a top government official again poses that question about how we are going to combat the Soviet Union in backward countries by providing a shorthaul, high-lift airplane with ruggedness and economy, we hope you'll remember the "Stout Bushmaster" which should be flying by the end of 1958. **ROBERT E. HAYDEN**, Hayden Aircraft Corp., Gardena, Calif.

Question: Who was first?

To the Editor:

I was very interested to see the photographs on page 23 of your Dec. 30 issue, of the NACA thrust reverser; this certainly does appear to have reached a high state of development. I note that NACA claims its device to be the first to be practically demonstrated and, in the absence of specific dates, I wonder whether this can be quite correct.

I enclose a composite photograph



showing, in the same three positions, Power Jets equipment, which was successfully flight-tested more than 10 years ago; the relevant patents date back to 1945 and a device was built in the same year, but the first flight-tests took place in 1946. Although the work undertaken at that time was in connection with the development of carrier-borne fighter aircraft, the photographs are of experimental equipment used in conjunction with a Power Jets W2/700 turbojet mounted in the tail of a Vickers Wellington Bomber. **T. G. HICKS**, Power Jets Ltd., 25 Green St., London.

WHEN—WHERE

APRIL

- Aeronautical Training Society**, annual meeting, Mayflower Hotel, Washington, D.C., April 10-11.
- Assn. of Local & Territorial Airlines**, quarterly regional meeting, Las Vegas, April 10-11.
- Federation Aeronautique Internationale**, IAS Building and Ambassador Hotel, Los Angeles, April 14-16.
- American Helicopter Society**, annual national forum, Sheraton-Park Hotel, Washington, D.C., April 16-19.
- International Airline Navigators Council**, annual convention, Piccadilly Hotel, New York, April 22-24.
- Flying Physicians Assn.**, spring cruise, Valley Ho Hotel, Scottsdale, Ariz., April 24-27.
- ATA Facilitation Committee** meeting, Miami Beach, Fla., April 29-May 1.

MAY

- National Flight Test Instrumentation Symposium**, Instrument Society of America, Park Sheraton Hotel, New York, May 4-7.
- American Assn. of Airport Executives**, annual business meeting and convention, Hacienda Motel, Fresno, Calif., May 4-7.
- Annual Miami-Havana Air Cruise**, sponsored by Florida Air Pilots Assn. (For details contact: J. G. Pace, 310 S.E. 2nd Ave., Miami), May 10-13.
- IRE national conference on aeronautical electronics**, Biltmore Hotel, Dayton, May 12-14.
- Airport Operators Council**, annual meeting, San Juan, Puerto Rico, May 12-16.
- Armed Forces Day Dinner**, Sheraton-Park Hotel, Washington, D.C., May 16.
- Observances in various cities**, May 10-18.
- National Fire Protection Assn.**, annual aviation fire safety seminar, Palmer House, Chicago, May 19-23.
- Aircraft Industries Assn.**, board of governors meeting, Williamsburg, Va., May 21-23.
- Aviation Writers Assn.**, annual convention, Shamrock Hilton Hotel, Houston, Tex., May 25-31.

JUNE

- Armed Forces Communications & Electronics Assn.**, convention, Sheraton-Carlton Hotel, Washington, D.C., June 4-6.
- Reading Aviation Service**, annual maintenance and operations meeting, Municipal Airport, Reading, Pa., June 6-7.
- International Automation Exposition & Congress**, Coliseum, New York, June 9-11.
- Annual Skylady Derby** (For details contact: Ruth Nickell, 904 Nickell Rd., Topeka, Kan.), June 12.
- Air Mail Pioneers 40th Anniversary Ball**, Beverly Hilton Hotel, Beverly Hills, Calif., June 14.
- Aviation Distributors & Manufacturers Assn.**, annual meeting, Mount Washington Hotel, Bretton Woods, N. H., June 25-27.
- AIEE transportation conference**, Statler Hotel, Buffalo, N.Y., June 25-27.

JULY

- All American Aviation Exposition**, Allegheny County Airport, Pittsburgh, Pa., July 4-6.

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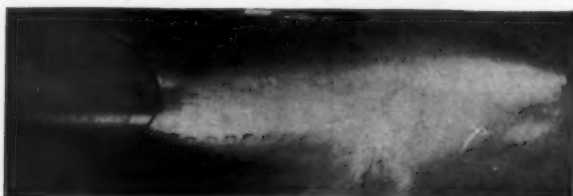
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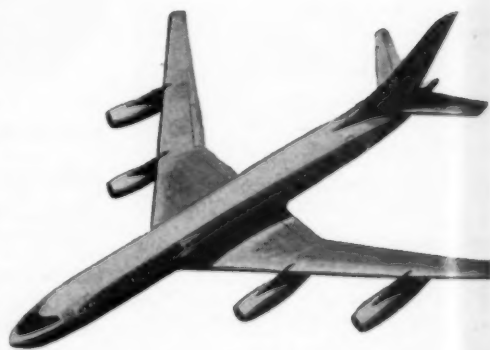


section of new B.F. Goodrich De-Icer continues to perform satisfactorily.

One of many safety features of the new Convair 880 commercial jet airliner is the B.F. Goodrich Cladheat De-Icer system on the empennage. Because the 880 will maintain unusually high cruising speeds in all kinds of weather, a de-icer was needed that could withstand abrasion from rain, dust—even hail—and still keep functioning dependably in spite of external damage.

The new B.F. Goodrich Cladheat De-Icer was selected because it meets this requirement, and also because it forms a smooth airfoil section and has low weight. Consisting of ribbon-type electrical heating elements sandwiched between layers of resin-impregnated glass fabric, the B.F. Goodrich De-Icer is molded into a single unit with a skin of stainless steel only .005 inches thick. This unit forms an integral part of the 880 empennage to give the de-icing system "hail-safe" protection.

Every plane has its own special de-icing problem. And B.F. Goodrich has been solving these problems longer than any other company. For more information on Cladheat de-icing, send for the free booklet, "Electrothermal Products". Write B.F. Goodrich Aviation Products, a division of The B.F. Goodrich Company, Akron, Ohio.



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Key to prosperity . . .

Aircraft industry has supplanted automotive as bellwether of nation's economic health

by Elizabeth Oswald

LATEST ECONOMIC BELLWETHER is the aircraft industry. Its place in the economic sun is still so new that it's hard for the experts to recognize the place of the industry as the No. 1 employer of labor in the United States—displacing the automotive industry and steel.

And the industry's troubles stem to a large extent from its dependence on military business, since military policy is constant only in change, itself. What are these troubles and how did they affect the economy? What is the place which this industry has in the current economic crisis? How can its resources be used to speed recovery?

Over the last five years, much of the defense dollar has been spent in the industry. Figures made available by the Defense Dept. show that about 38% of the defense hardware dollar has been spent with 10 contractors, and about eight of these are aircraft or engine manufacturers.

On the surface this would seem to mean that these companies, all of whom do a large percentage of their business with the Defense Dept., could well afford the cutbacks and stretchouts of last summer and the expenditure ceilings, which were all a part of the economy wave.

Where does money go?

But what is not generally recognized is that the money doesn't stay with the 10 or 15 major contractors.

An analysis by Convair Division of General Dynamics Corp. shows what happens to the funds which are channeled to the big aircraft builder by government contract. Taking the new B-58 medium supersonic bomber, just starting into production for inventory, as a sample, the company found that the major subsystems for the B-58 cost \$586 million through Phase 3—production of limited quantities for test. Total for the whole program to date \$723 million.

All of the 16 major subsystem manufacturers are, of course, large

companies in their own right. But outside production totaled \$75.9 million. Of this figure 78% went to 28 large companies and 22% to 100 small businesses.

Carrying the process one step further, Convair found that raw material and purchased parts accounted for \$79 million. Here too the percentages held—78% to big companies, which numbered 940, and 22% to 2,800 small companies.

And many of these companies, of course, had other and lower-tier subcontractors and vendors. What did the stretchouts, cutbacks and reductions in progress payments mean to the subcontractors down the line? What part did these orders play in the current uncertain economic climate?

B-58 in every state

The wide distribution of the orders for work on the weapon system is paralleled by payments distributed to every state in the Union and the District of Columbia. Payments ranged from a low of \$9.10 for a single transaction in Idaho to a high of more than \$76 million for some 824 transactions in New York in 1957.

And the B-58 story is only the latest of the stories of the wide distribution of aircraft production and development funds—a story which makes Boeing Airplane Co. the largest single employer of people in the state of Washington, where roughly 46% of all of the production workers of the state toil for Boeing.

What does all of this mean to the national defense and to the economy? Can this industry be set apart as a convenient instrument of national policy—to slow up expansion or to reverse an unfavorable economic trend? Obviously the answer is "yes," since the industry reaches into every state of the United States and into many businesses both large and small. This fact has resulted by itself in a sharply reduced demand for strategic materials, for steel, copper, aluminum and nickel

—all adding to the current reduction in the operating levels of basic industries.

The result is that not only is the national security in jeopardy because of economic dislocations, but the economy itself is still stifled by expenditure controls which were not lifted with Sputnik. Current position of the industry is still uncertain because of spending ceilings made unrealistic by inflation, but with the industry the whole of the economy is affected.

Perhaps the situation was best summed up by Gen. Orval R. Cook (USAF ret.), President of Aircraft Industries Assn., who said, in a recent speech:

"The earnings rate of our industry already is well below the average of all industry. Our requirements for capital are at an all-time high. The government is demanding that we finance more of our work in process and provide more of our basic facilities. Added to all this, the decisions of the Renegotiation Board in endeavoring to recapture what it calls 'excess profits,' earned three or four years ago, are little short of catastrophic.

Restrictions stifle incentive

"We thoroughly agree that the Government should recapture *truly* excess profits. Adequate laws to accomplish this, such as the Vinson-Trammel Act, already exist but the Renegotiation Act, as presently administered stifles incentive and encourages inefficiency."

Gen. Cook added: "A financially sound aircraft industry is vital to our security. Artificial restrictions and ex post facto decisions which tend to weaken it should be removed." And it might be added that under current conditions a weakened aircraft industry—a tool not only of changing defense policy but also of changing fiscal policy—is not only dangerous to the national security but is even more dangerous to the national economy.

Exclusive

How to train more pilots faster, Navy style

PORT WASHINGTON, N.Y.—Naval Training Device Center has disclosed details of new techniques of pilot training designed to permit more rapid indoctrination of large numbers of crewmen on complex aircraft systems and procedures.

Capt. Edward C. Callahan, commanding officer and director of NTDC, says the new approach introduces the use of systems and procedures demonstrators that permit pilots to better visualize the end results of cockpit action on the controls.

In contrast to past methods, the new units substitute a typical classroom situation for an actual cockpit situation.

First group of the new trainers have been assigned to Navy's basic training and advanced training units at Corpus Christi, Tex. They will be used in instruction on the Grumman F9F-8T and Lockheed T2V-1.

Designed by Harold Florea and James Lacombe, project engineers at

NTDC, the trainers are being built by Burton-Rogers Technical Training Aids, Inc. of Cincinnati.

According to one Burton-Rogers official, the Navy development has a direct application to airlines planning jet operations. His proposal involves substitution of about six of the new systems trainers (plus a cockpit procedures trainer) as a substitute for a full-fledged aircraft simulator, particularly for carriers facing a tight money situation.

Florea says the new training method is revolutionary in concept and promises to bridge the instructional gap on new aircraft. Plan is to put the demonstrators to use in the training cycle between present phases which employ overhead projection slides and the cockpit procedures demonstrator.

Navy experience in recent years shows that the transition from training by slides to the cockpit trainer involves too great a spread without some in-

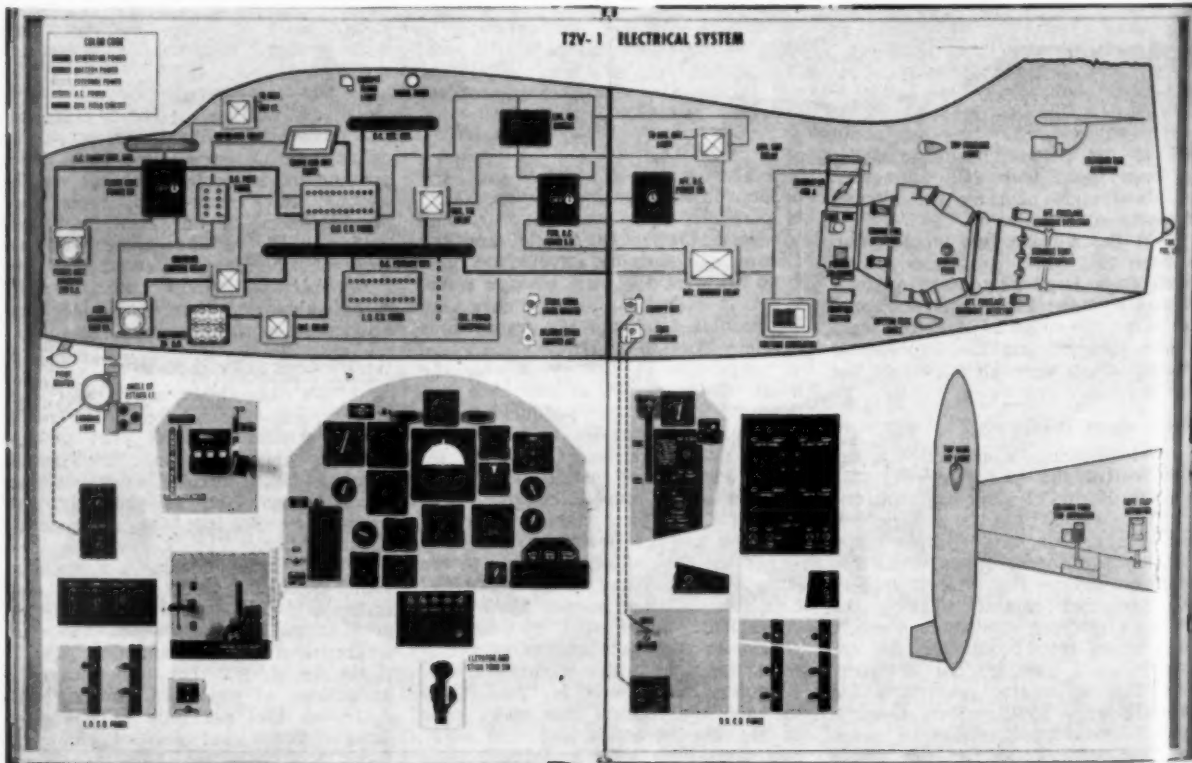
terim step. The new systems and procedures demonstrator is the Navy's answer to the problem.

One advantage of the new approach is that it allows a pilot trainee to operate a system in class using cockpit controls, with the class on hand to observe and criticize his actions.

The result of a particular control movement by a student is emphasized by backlighting the individual pressure and electrical lines to various components affected.

This feature permits students to observe proper and improper operation of a given system.

As an additional feature, the instructor has a separate set of switches and controls which permit him to override student actions or to create emergencies to exist in the system. This encourages a trainee to think in terms of emergency procedures and the corrective systems he controls during operation of the aircraft.



BRIDGING THE GAP in Navy training cycle is this new systems and procedures trainer developed at Naval Training Device Center and produced by Burton-Rogers Technical Training Aids, Inc. Training panel displays electrical system of Lockheed T2V-1 complete with backlighting effects that show results of movement of a cockpit control by a pilot trainee.



DUCTED PROPELLERS of U.S. Army's Doak Model 16 VTOL research vehicle are rotated for vertical takeoff. Chief test pilot Ed Dietrich is at controls. In rear seat is Jim Reichert, second pilot and Doak's chief aerodynamicist.

Doak ducted-fan VTOL set to fly soon

TORRANCE, CALIF.—Army's newest VTOL aircraft, rolled out here recently by Doak Aircraft Co., is far from being a novice entry in the fast-shaping and highly competitive VTOL design field.

Company president Edmond R. Doak has experimented with the ducted fan and various air-moving principles since 1935. First proposals to the military were made early in 1950. Today, eight years later, the Doak Model 16 is a VTOL testbed "in being" and ready for development testing.

Fairly conventional in appearance with the exception of large, 5-ft.-diameter ducts at each wingtip, the aircraft has a total span of 26 ft., overall length of 32 ft. and height of 10 ft. at fin. Design gross weight is 2,600 lbs.

Air intakes for the Model 16's 825-hp Lycoming T53 gas turbine are located on the fuselage sides just below the wing root. The T53 is mounted in the fuselage at about the aircraft's center of gravity when empty. Power to the wing ducts is transmitted from a "T" takeoff box on the engine's output shaft to the wingtips via a four-inch tubular aluminum shaft and two smaller (1 1/4 in.) steel shafts. The drive trains have a total length of about 10 ft.

For flight, the use of standard controls is claimed as one of the main advantages for this type of aircraft. An electronic and mechanical interlock system handles all necessary functions for both hovering and forward flight. No additional cockpit controls are required.

Wingtip ducts are about six inches

thick with a four-foot inside diameter. Of aluminum alloy construction with a fiberglass nose ring, the ducts have a Doak-designed airfoil section that also makes them useful as "ring wings" or end plates during a conventional takeoff and landing.

Air is drawn through the forward section of the duct past a set of inlet guide vanes. The vane angle or pitch is controlled by the interlock system during VTOL or hovering operations, to obtain roll control by application of differential thrust.

Although most performance data

on the Model 16 is classified, it reportedly can lift considerably more weight per square foot of swept disc area than a helicopter despite the small sweep of the ducted fan.

In a similar ducted fan proposed to the military in 1954, Doak specified capability to hover for one hour, a top speed of 550 knots, 365-knot cruise, all-out range of 1,800 miles and a gross weight of 5,000 lbs. without external fuel stores.

Present Doak development is funded by Army's Transportation Research and Engineering Command.



DOAK 16 in position for conventional takeoff and horizontal flight. Test pilot Ed Dietrich is slated to be first to fly Doak testbed. Second pilot Jim Reichert will alternate with Dietrich at controls during evaluation program.

Conflict . .

From the pilot's seat

by Karl M. Ruppenthal

"FIVE HUNDRED miles per hour, eight miles above the earth, travel in luxurious comfort! Breakfast in Paris, then race the sun to breakfast again with friends meeting you in New York," runs the advance publicity. The jet age is all but here. It is a picture of speed and luxury. How beautiful to contemplate!

But the symphony is not all music. There are raucous sounds in the air. It looks like the new \$4-billion jet fleet may be grounded before it ever takes to wing. A deep controversy is already raging. It concerns who shall man the Boeing 707s, the Lockheed Electras, the Convair 880s, and the Douglas DC-8s. While deliveries of the jet planes are less than a year away, the battle for wages and working rights is under way.

The Flight Engineers International Assn. (FEIA) has taken strike votes against United Air Lines, American and TWA. The Air Line Pilots Assn. (ALPA) is taking strike votes on Eastern and Pan American. Eastern Air Lines, with its long tradition of amicable pilot-company relations, is now faced with the possibility of a strike by both flight engineers and pilots, each threatening to strike if the company accedes to the demands of the other. There are some elements of the common jurisdictional dispute, but this dispute goes much deeper.

When the airlines ordered jets for delivery in 1959, ALPA undertook

studies on how these faster planes would affect working conditions. In their work with the jet manufacturers, they came to realize that the work of the third man on the jet would be vastly different from what it is today on piston-driven aircraft.

Today's flight engineer is concerned mainly with propeller and mixture controls, cowl flaps, engine superchargers and oil cooler flaps. He manipulates the cowl flaps on the take-off roll, adjusts the throttles in the climb and regulates the fuel mixtures for maximum performance. He is concerned with the setting of oil cooler flaps for proper engine cooling.

But tomorrow's jet will have none of the controls which today occupy the attention of the flight engineer. There are no propellers, no mixture controls, no cowl flaps, no oil cooler flaps. Cabin pressurization will be largely automatic.

Virtually all of the functions of the present-day flight engineer are gone. Many of the systems will be electronic. If they malfunction, no repairs can be made in flight. Of the flight engineer's major task, only fuel management remains. And this can probably be done more efficiently and more cheaply by electronic computing devices.

This means, simply, that there will be little reason why the third crew member on tomorrow's jets needs to be a qualified mechanic. Indeed it

would be a social waste to put a well-trained mechanic into a spot where his skills cannot be utilized. The Air Force, even in its largest jets, carries no flight engineer.

While the duties of the flight engineer will be simplified, those of the pilot will not. The number of planes in the air has been increasing at a rapid rate. Important airports like Chicago and Washington have about reached the saturation point. Faster planes means that the effective area of congestion will reach farther from the airports, and that the pilots will need to be more alert than ever.

The jets will consume a tremendous amount of fuel—two or three times as many gallons per hour as today's planes. At low altitude the fuel consumption is simply fantastic. This means that the pilot must plan his flight more carefully. He will have little time to "hold" at an airport awaiting weather improvement. He will need to make important decisions much faster than he needs make them today.

When two Piper Cubs three miles apart approach each other traveling at 60 mph, the pilots have a minute and a half to take evasive action. But when jets travel a collision course at 600 mph, the pilots will have but nine seconds to react if they see each other three miles away.

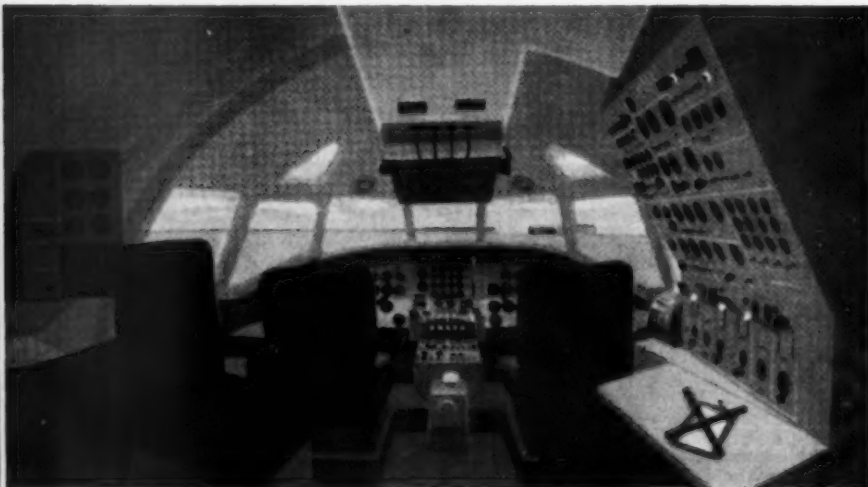
This means, say the pilots, that there must be two pilots in the cockpit at all times to watch for traffic. When one pilot goes aft to greet passengers, or for more urgent reasons, there should be another pilot at hand to take his place. While airborne radar is good for locating storms and rough weather, it is not yet sufficiently sensitive to locate oncoming planes.

Even if practical electronic devices one day eliminate the need to watch for traffic, a third pilot will still be necessary. This is because of the possibility of explosive depressurization. Today if a window blows out of a plane flying at 20,000 ft., it is relatively simple to bring the ship down to 10,000 ft. where supplementary oxygen is not mandatory.

But what will happen if a window blows in a jet flying at 45,000 ft.? A pilot will have but a few seconds in which to don an oxygen mask and start an emergency descent to a viable altitude. If one of the pilots is not fast enough, he may be overcome by anox-

(Continued on p. 28)

POINT OF CONTENTION: flight engineer's station (marked X).



... in the cockpit

From the flight engineer's station

by George R. Petty, Jr.

THE ARGUMENT advanced by Air Line Pilots Assn. about flight engineers and their need on airline transports is not new. The jet and turboprop transport is simply a new excuse for its introduction in current contract negotiations.

Any real appreciation of what has happened in the past makes this abundantly evident.

The Air Line Pilots Assn. Eastern Air Lines Council in 1954 decided that certain rules in CAB-proposed Part 40 concerning flight engineers diminished their paramount authority in the cockpit, and demanded that Eastern train all its captains to enable them to obtain flight engineer licenses.

When refused, the pilots threatened to strike, whereupon Eastern Air Lines and 13 other carriers represented by the Air Transport Assn. petitioned for delay in the April 1, 1954 effective date of Part 40. They sought changes in the rules on flight engineers to permit an airman holding only a commercial pilot's license to satisfy the requirements.

CAB denied the request for postponement and in so doing said: "A review of the ATA petition discloses no substantiating data for the statement that the provisions in question create a safety hazard in the cockpit. Although the petition refers to a general jurisdictional dispute between pilots and flight engineers employed by Eastern Air Lines, which dispute was ostensibly based on the extent of the authority of the pilot-in-command, interpretation No. 1 of Part 40, adopted March 26, 1954, makes abundantly clear the paramount authority of the pilot-in-command. Indeed, the statements of the President of the Flight Engineers' Union . . . belie the allegation that the Flight Engineers' Union has taken the position that 'the flight engineer's panel is wholly within their jurisdiction and not subject to the direction of the pilot.'"

Later the CAB refused to change the rule because "the mechanical complexity of aircraft types introduced into service since the initial promulgation of requirements for a flight engineer justifies to an even more marked degree the necessity for providing within the flight crew on certain air carrier aircraft a crew member, in addition to the pilots, possessing more extensive experience and training with respect to

the mechanical operation of aircraft than is presently required of pilots."

These decisions were rendered just four years ago, at a time when the aviation press was full of the news that the era of commercial turbine transports was just around the corner. Civil Aeronautics Administration at that time was conducting studies of the regulatory problems of turbine operations.

Following the denial of the ATA petition, FEIA signed contracts with airlines (including sections on qualifications which formalized requirements for mechanical background previously embodied in company policies. Under the regulations at that time and today a pilot could become a flight engineer if he demonstrated his flight engineering knowledge and proficiency in accordance with the regulations.

Airlines had the option to choose the kind of flight engineer they wanted and did so, with the result that 90% of the world's flight engineers make a career out of flight engineering, do not seek or expect reclassification to pilot, have a separate seniority list, and are represented by their own bargaining agents.

Now the same argument that was laid to rest in 1954 and 1955 has reappeared with new trimmings. It is decreed by ALPA that all flight deck crew members on turbine aircraft must not only be pilot-qualified but also be employed by the company as a pilot.

We hear that safety demands a third pilot crew member, but this seems to be the case only on aircraft requiring a flight engineer. No one talks about "fail-safe" crews for the Convair-Eland turboprop, or the Viscount, or the Fairchild Friendship, or any of the smaller executive jets with

a crew of just two pilots.

From the technical side, FEIA can demonstrate the many reasons why the specialized technical flight engineer is the necessary addition to the piloting skills available in the jet crew. It is apparent from the experience of military and civil operators of high-altitude, high-speed jet aircraft that the safety of the flight may well depend upon the proper analysis of airconditioning or pressurization system instruments to prevent or provide warning against a failure of the devices that keep humans alive in the unfriendly environment at 25,000 to 40,000 ft.

The use of alternating current with mechanical constant speed drives for generators will increase the complexity of the instrumentation and control of jet electrical systems by 70%.

Vibration and combustion analyzers are being developed for use on turbine engines to provide new tools for inflight diagnosis of powerplant troubles. Fuel management for swept wing jets becomes more important at cruise fuel flows of 13,000 lbs. per hour, where mishandling of boost pumps or tank selectors can cause thousands of pounds of lateral unbalance in minutes and appreciable fore and aft shift of the center of gravity of the aircraft.

Development of new systems, like the Kollsman Integrated Flight Instrument System, to ease the burden of the pilot, has made electronic complexities out of formerly simple devices such as airspeed indicators and altimeters.

Alan B. Hunter, principal surveyor of the British Aviation Insurance Co. Ltd., wrote to FEIA recently: "One aspect is to my mind quite clear, (Continued on p. 29)

About the authors . . .

Karl M. Ruppenthal, presenting the pilot's view of this issue, has been an airline captain for 16 years. A few years ago, as a participant in the Behncke Revolution in ALPA, he held the post of executive vp of the union for several months. Ruppenthal holds a masters degree in industrial relations from Univ. of California, is a member of the bar in the District of Columbia and is on the national panel of arbitrators of the American Arbitrators Assn. At present he is on airline leave working on a Ph.D. in executive management at Stanford under a Sloan Foundation fellowship.

George R. Petty, Jr., a former Pan American World Airways flight engineer, took over the presidency of Flight Engineers International Assn. last Oct. 1. A Princeton graduate, the 28-year-old Petty ranks as the youngest president of an international labor union.

Pilot's view . . .

(Continued from p. 26)

mia. A third pilot would be an important safety factor in such cases.

Pilots reluctantly admit that the nation's pilot force is not getting any younger. In the past year two pilots have died in the air of heart attacks. There is nothing to indicate that more exhaustive physical examinations could have given advance warning. The answer, says ALPA President Sayen, is to put a third pilot on board. Today's aircraft can generally be flown safely by one pilot. The second man is in large measure a safety factor. Tomorrow's aircraft will probably require two pilots continually. And safety will demand a third pilot, says ALPA.

While ALPA has been making exhaustive studies of tomorrow's aircraft, FEIA has not been idle. Through the years that ALPA has been fighting for increased wages, improved working rules, FEIA has been content to follow. The airlines have, with little resistance, given the flight engineers the same contract benefits which were wrested from them by the pilots. The Flight Engineers have used their energies, instead, in improving the security of their union.

While jet aircraft are at least a year away on most airlines, FEIA has demanded of the nation's airlines that they write into their present contracts a section guaranteeing that the third

man on jets will be mechanic-trained. All thought of wage increases and working conditions for flight engineers presently employed has been subordinated to the so-called "scope clause." This would guarantee to FEIA not only that their members would man the jets today, but that all jets in the future would carry a flight mechanic. He would, incidentally, be represented by FEIA.

"Featherbedding, pure and simple," said the president of one of the major airlines. "Their threat to strike to force us to carry a mechanic who is not needed would be like a strike of the propeller specialists simply because the jets have no propellers." Not so, claims FEIA. The jets will need a third man, and that man should rightfully be a professionally trained flight engineer.

Caught in the squeeze are the airlines. The paradox is great on Eastern where the engineers threaten to strike unless the company guarantees them a job on the jets, while the pilots threaten to strike if it does! The airlines would like to have the issue resolved now. While they do not relish the thought of a strike at any time, it would be easier to stand one now while business is slack than when the jets are actually here. Today's DC7s have a book value of about \$300,000 each. It would be far less expensive to have them grounded by a strike than new jets costing \$5 million each.

If the dilemma is great on Eastern, it is even worse on Pan American. This line signed a contract with FEIA calling for mechanic-trained flight engineers on their aircraft for the next three years. While management evidently thought it was buying labor peace, instead it got a hornet's nest. The new third-man pay scale is so high that, if it stands, pilot pay will have to be increased about 35% to maintain historic wage differentials. In addition to this, PAA may still be forced to carry a third pilot for safety reasons. If this occurs, its cockpit costs may well be 25% above those of TWA and its European competitors.

Interwoven in the whole dispute is the jurisdictional aspect. FEIA, like any other organization, does not relish the idea of a dwindling membership. If the jets are not manned by mechanic trained engineers, FEIA's membership would be limited to those professional engineers flying Connies, DC6s and DC7s. A rapid retirement of piston-driven aircraft could put some flight engineers on the ground. Both the security of the present flight engineers as individuals, and of FEIA as a union, are involved.

And where in this dispute is the A.F. of L.? George Meany and his lieutenants do not relish the idea of such a family struggle. FEIA has been charged with raiding ALPA affiliates, and the feud has smoldered for months. The Executive Committee of



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the AFL-CIO recommended that the two unions merge. ALPA President Sayen agreed to immediate merger talks but the FEIA refused.

And so the double buzzsaw continues. The airlines may be struck if they refuse to guarantee the mechanic-trained engineer a job on the jets, and they may be struck if they do. Furthermore, if they acquiesce to the demands of FEIA, they may be forced to carry a mechanic-trained engineer on supersonic jets 20 years from now when they have no need whatever for one. Who can say now what crew complement will be needed then? Perhaps the need will be for three electronics engineers!

Is there a solution to the problem, I asked the president of one of the Big Four airlines. "Hell, yes," he said brusquely. "We're willing to do all kinds of things to make sure that our flight engineers won't suffer because of the coming of the jets." Then he outlined some of the things his company was willing to do. His ideas included the following:

1. All flight engineers who could qualify as pilots would be trained at company expense and allowed to fly in any spot to which their seniority entitled them.

2. Presently employed flight engineers would be guaranteed job security as flight engineers as long as the company operates piston-driven aircraft. "And that will be for a mighty long time," he added.

3. Some arrangements could be made for early retirement for those engineers desiring it.

4. If the jets come rapidly, presently employed flight engineers would be guaranteed good jobs in the maintenance shop, where they are sorely needed.

5. At their option, engineers could accept severance pay.

"We were willing to give our engineers all of these things," he continued. "We don't want them to lose a nickel because of the changeover to jets. But the only thing they would talk in negotiations is the 'scope clause.' And that would hogtie the airline forever."

While the A.F. of L. has made loud noises, it has not yet taken an active part in the matter. It is possible, of course, that George Meany might force a settlement under the machinery which was set up to resolve jurisdictional disputes. Or the emergency board appointed by the President to hear both disputes on Eastern Air Lines may set a pattern for the industry.

But today the controversy smolders. It is reaching such intensity that it may ground the nation's airlines. And the saddest part of all is that there is enough productivity in the jet airliners of tomorrow that nobody needs to suffer. There will be dollars and jobs enough for all today's employees if FEIA and ALPA and the airlines will just get together.

Engineer's view

(Continued from p. 27)

and that is that the greater complexity of modern systems engineering is a potential source of airborne emergency in one form or another, and that occasions will arise when an accurate diagnosis of a problem and a clear appraisal of the proper course to follow may save disaster.

"Such occasions may be rare, but these are \$5-million airplanes and may contain upwards of 200 people and a valuable crew so that one "avoidance" in two years justifies the means enabling the avoidance to be made.

"It is in this diagnosis field that the flight engineer would be invaluable. The amount of knowledge that a pilot today is called upon to assimilate precludes any real hope that he could also be an expert in systems engineering diagnosis, and I believe that, properly trained, a flight engineer can fill this gap."

If, during a mach-limited transcontinental Boeing 707 flight, the cruising airspeed were allowed to go beyond the desired Mach number by 1% (within instrument error tolerances) the fuel reserve for holding at 15,000 ft. could be reduced by 25% and its range at 20,000 ft. after destination decreased by close to 75 miles.

Such a situation might be avoided by careful monitoring of performance in flight by the flight engineer.

Airlines all over the world have shown they agree with the flight engineers. BOAC carries a specialist flight engineer on its turboprop Britannia and has announced that "in accordance with this policy the Comet IV, the Boeing 707, and the VC-10 are to have an engineer's position built into them."

Technical-specialist engineers

El Al and Aeronaves de Mexico, the only other Free World airlines currently operating gas turbine equipment of over 80,000 lbs. gross weight, are carrying technical specialist flight engineers on Britannias.

In the U.S., Pan American World Airways has signed a contract with FEIA covering its Flight Engineers in the jet era and has listed the five reasons for doing so:

By pre-existing contract the professional engineers are entitled to perform the engineering function where it is performed by a separate individual in the cockpit, and thus they deserve reasonable assurance that they will be safe in these jobs when the shift to jet planes takes place.

The National Mediation Board holds that, under the Railway Labor Act, the FEIA, AFL-CIO, is the proper bargaining agent for flight engineer employees. During six weeks of active mediation the Board urged that we include in our settlement with them a recognition of the right of their members to serve as Flight Engineers on Pan American planes, including jets, when such engineers were required to

perform only the engineering function.

Jurisdiction of this union over those performing flight engineering functions also is recognized in writing by AFL-CIO Washington headquarters.

It is important that the company be able to make plans for training and assignment of crew members for jet operations as soon as possible, and this contract makes this possible as far as Flight Engineers are concerned.

The agreement assures continuation of the Company's strict safety policy of using only highly trained and qualified engineers on its flights.

Mechanical-specialist engineers

Eastern Air Lines has stated in current Presidential Emergency Board hearings in connection with FEIA's contract dispute that it intends to carry mechanical-specialist flight engineers on its turbine aircraft.

On March 25, American Airlines signed a five-year agreement with its FEIA flight engineers which provides assurance that the flight engineer's job on turbine aircraft will be performed by flight engineers covered under that agreement.

Since CAB has not found a need to change the regulations governing flight engineers, ALPA becomes the only voice in the industry claiming that a safety hazard exists. But though it claims the problem is technological, and a matter of safety, its representatives have told flight engineers that, if they will only join ALPA, an arrangement could be worked out whereby non-pilot qualified engineers could be allowed to perform their duties on the jets.

In view of this, any claim that the flight engineer must be a pilot and join the pilots' union cannot seriously be advanced in the name of safety.

It seems probable that much of the controversy stems from the concern of ALPA over temporary unemployment of pilots resulting from the conversion to larger, faster gas-turbine equipment. As small non-flight engineered equipment is sold and replaced by flight engineered jets and turboprops, many pilots will be furloughed while the flight engineers' lists remain stable.

This concern has caused ALPA, on airlines where it has given up its efforts to replace flight engineers, to demand that a fourth crew member from the pilot ranks be carried on turbine aircraft.

On one airline ALPA has approached FEIA officers directly with demands that protection for furloughed pilots be provided by allowing them to take flight engineer jobs.

Whatever the reasons, ALPA has used the introduction of turbine aircraft into commercial service to revive an argument which it lost four years ago. The regrettable results of the program have been to divide ALPA, damage its reputation in the industry, hurt the airlines, and distract the attention of flight crews from the technical and labor problems of gas turbine transports on which they should work together mutually.

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Lockheed ready to roll on JetStar... if

by George V. Hart

MARIETTA, GA.—If the USAF team evaluating contenders in the off-the-shelf jet utility transport competition selects Lockheed's JetStar, the company's Georgia Division would roll out 10 airplanes per month starting 17 months after the go-ahead.

This is the basis of Lockheed's proposal to the Air Force. However, with 150,000 sq. ft. of factory space set aside for JetStar production, this rate could be stepped up.

If the Air Force requires that its utility transport be powered with four engines (a strong probability), design delays would not plague Lockheed's starting date.

If a large corporation should prefer the twin-engine version as an executive transport, the company could fill the order without disrupting the production rate.

This versatility is due, of course, to the fuselage mounting of the engine pods. The twin-engine version can be converted easily to a four-engine configuration. Power packages are removable at the fuselage as units.

Lockheed's design philosophy is to provide space for engine controls, wiring, plumbing, instrumentation, etc. for the four-engine airplane.

As a result, says Louis J. Bauer, engineering experimental division manager here, running twin- and four-engine JetStars down the same production line would be simply a matter of parts scheduling.

This method of mounting engines is nothing new to Lockheed. It has figured in the company's design proposals off and on since 1949 when the Model L-193 large jet transport rolled off the drawing boards but mired down after reaching the mockup stage.

Lockheed's 600-mph plus utility jet



SPORTING its new paint job, the JetStar will make Washington, D.C., its first stop in a nationwide tour of command headquarters. Junket, scheduled to start in mid-April and last 20 days, will give groups of Pentagon and top-ranking military leaders an opportunity to view and fly in the new plane.

JetStar details:—10-passenger, 4-engine version

Basic data: length, 58' 10"; height, 20' 6"; span, 53' 8"; leading edge sweep, 34°.

Categories	Standard	Long Range
Empty weight (lbs.)	15,400	15,400
Normal fuel—integral wing tanks (lbs.) ..	11,000	11,000
Normal takeoff weight (lbs.)	29,100	29,100
External fuel and tanks—640 gal. each (lbs.) .....	.....	9,400
Max. takeoff weight (lbs.) .....	.....	38,600
Rate of climb—normal rated power (fpm); military power (fpm)	4,100 6,400	2,700 4,300
Normal cruise speed at 45,000 ft. (kts.) ..	435	410
Max. cruise speed (kts.)	533 (15,000 ft.)	517 (13,000 ft.)
Max. range (n.m.)	1,550	2,855
Max. landing weight (lbs.)	2,600	2,600
Stall speed (kts.)	90	90
Ground roll (ft.)	2,170	2,170
Landing distance from 50-ft. obstacle (ft.)	3,290	3,290

Advantages of the fuselage mounting method go far beyond versatility in production, says Norman A. Keller, JetStar project engineer for the Georgia Division, emphasizing the safety features.

There are no fuel cells in the area of the engines; consequently, it is extremely unlikely that an uncontained compressor or turbine failure would start a fire.

Extensive model tests have satisfied Lockheed that fire hazard as the result of a gear-up landing is greatly reduced.

The aft pressure bulkhead is forward of the engines' compressor sections; therefore, a blade failure would not result in explosive decompression.

Asymmetric loads are no problem in single-engine flight.

Keller also points out these other advantages resulting from the JetStar's engine mounting configuration:

Protection afforded by wings elimi-

nates the chances of engine damage due to ingestion of foreign objects from runways.

Nacelle leading edges extend slightly over the trailing edges of the wings making it impossible for the wheels to kick stones, etc. up into the engines.

Since engines are not hanging beneath the wings, landing gear and wings may be made lighter. In addition, wing aerodynamic characteristics are better in terms of critical mach number.

Noise level is reduced in cabin and cockpit.

Ram recovery against angle of attack is better, due to the guide vane effect created by the wing.

Engine control linkage is simplified by absence of wing flexing worries.

Manufacturing techniques used by Lockheed in production of the JetStar would be pretty standard, says Bauer. However, the following operation is of particular interest:

guidance system experts through **ERCO** training devices

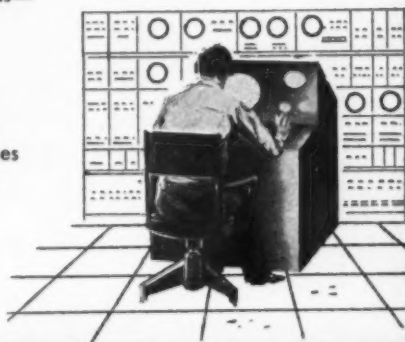
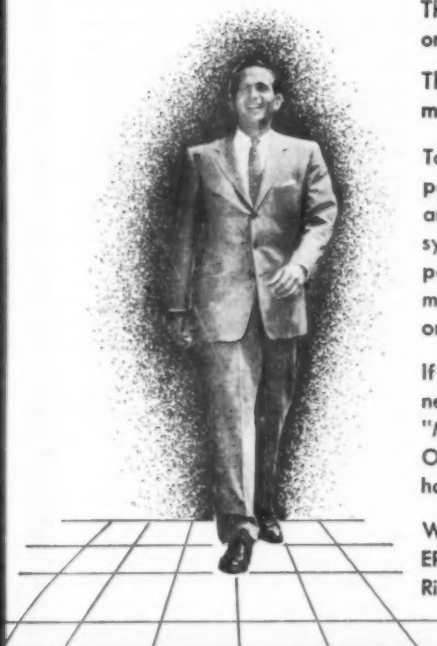
The guidance system of a missile is critical to its purpose—without the system—or without intelligent handling of the system's equipment there is no effective weapon.

The military must train its "unskilled short-term" personnel to operate and maintain this system—and the question arises . . . How?

Today ERCO is building training devices for this very project. A system which will permit accelerated, highly specialized training for individual personnel and teams assigned to the operation and maintenance of the guidance system. These ERCO designed devices will quickly, and economically permit the military to obtain skilled technical personnel with maximum specialization on a minimum time basis—or the term we use "effectivate*" the system.

If you are a contractor and you are in need of someone to solve the problem of the "Man-Machine Data Link"—contact us today. Our leadership in the creation of training devices has been gained with field proven equipments.

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What's in the JetStar cockpit



(1) Ground steering wheel. (2) Pilot's flight group with Collins MA-1 flight director system. (3) Space for Bendix RDR-1D weather radar controls and scope (18" dish antenna). (4) Engine instruments with fire indicators and panic handles above. (5) Warning light signal system and landing gear selector. (6) Copilot's group with ARN-31 glide slope and ILS. (7) Center stand: ARN-14 Omni, ARN-6 ADF, Lear L-17 autopilot, trim, flap and power controls. (8) Overhead: ARA-26 keyer, ARC-34 UHF and Aircraft Radio Corp. -12 VHF. (9) Overhead: Electrical system, air conditioning, engine starting.

The skin and T-sections of the integrally stiffened wing panel extrusions taper off from wing root to tip. The 7075TS aluminum can be machined or chemically milled to accomplish this. Although Lockheed has tried both methods, it is felt that chemical milling, which so far has been done by U.S. Chemical Milling Corp., Manhattan Beach, Calif., is faster and better than machining. Skin surfaces are left smoother.

Wing panels 26 ft. long are lowered into a tank 60 ft. deep. Taper is governed by rate of withdrawal from the chemicals.

One of the most challenging tasks performed by Lockheed's engineers was that of equipping the JetStar with high-performance systems normally associated with much larger jet transports.

Production airplanes would be pressurized and air-conditioned by bleeding air direct from the engine compressors through an AiResearch refrigeration unit. In the prototype, air to the refrigeration unit was drawn from two air turbine motors. With a flight altitude of 45,000 ft., cabin altitude is maintained at 8,000 ft.

An 1,800-psi oxygen supply has its source in three 514-cu. in. capacity bottles.

Passengers' oxygen supply is controlled from the cockpit. However, presentation of disposable-type oxygen masks to passengers is automatic. Masks and demand regulators for 100% oxygen pop out of compartments beside the seats when cabin pressure differential reaches an unsafe level.

In case the sleeping passenger

should fail to awaken when he gets a lap full of oxygen equipment, a warning horn also sounds automatically.

Main difference between prototype's Bristol Orpheus 1/2 turbojets and Wright TJ37, General Electric J85 or Fairchild J83 engines proposed for production airplanes is that latter are equipped with accessory drives.

JetStar's DC electrical system includes two 350-amp starter-generators and two 12-volt batteries in series connected to the bus for partial voltage stabilization and emergency power. AC supply proposed for production airplanes consists of two 1,500-VA, 115V, 3 phase, 400 cycle inverters (one a standby) for radio equipment, a 250-VA inverter for the pilot's panel and 150-VA unit for copilot's instruments.

Two separate hydraulic systems are provided, each supplied by a 3,000-psi engine driven pump. In addition to a 1,500-psi electrically driven pump tied into No. 1 system, external connections are provided for both systems for ground checkout, etc.

Elevator and aileron boost is provided by both systems, either one of which is said to be adequate for control requirements.

Wing flaps and wheel brakes may be operated using either system; however, pressure for landing gear, speed brake and nose wheel steering may be drawn only from No. 1 system.

Radio and navigational aids (see cockpit photo) although proposed to USAF, are optional as to manufacturer with final choice left to the customer—subject, of course, to feasibility of installation.

Lockheed's claims relative to JetStar performance have been proved out in accelerated flight testing of the first prototype airplane. In the first six months of this program, the airplane was flown 155 hours for a total of 131 flights.

Maximum speed originally was given as 560 mph. Actually, speeds over 630 mph have been attained.

Maximum takeoff weight has been increased to 38,600 lbs. for the 10-passenger version and maximum landing weight has jumped from 21,000 to 26,000 lbs.

The airplane has been flown more than 1,500 n.m. in its normal configuration. With 640-gal., long-range "glove" tanks installed, range is given as greater than 2,200 n.m. against a 70-kts. headwind, surpassing Air Force specifications.

During a recent flight from Edwards AFB to Marietta, the JetStar covered the 1,672 n.m. without external tanks and landed with 1,650 lbs. of fuel remaining.

Average speed during the flight was 557 mph at 45,000 ft. Block-to-block time was 3 hrs. 29 mins.

Summing up these and other performance statistics (see tables), Lockheed contends that operators will save millions of dollars by using utility jet transports instead of obsolete piston-engine types.

JetStar's maintenance and operating costs

Categories	JetStar	Twin-engine propeller planes			Four-engine propeller plane
		Type 1	Type 2	Type 3	
Maintenance cost/hr:					
Depot	\$28	\$9	\$27	\$30	\$46
Base (labor)	14	22	28	32	58
Base (material)	5	6	5	6	9
Cruise speeds (mph) ...	506	138	161	181	196
Cost/airplane mile	\$2.64	\$3.78	\$5.71	\$5.88	\$9.28
Cost/seat mile:					
2 seats .....	.132	.185	.286	.294	.464
4 seats .....	.066	.091	.143	.147	.229
6 seats .....	.044	.060	.095	.098	.152
10 seats .....	.026	...	.057	.059	.093
12 seats .....	.022	...	.047	...	.076

Study is based on 600-hour/year utilization, 1,500 n.m. trip, no crew cost, depreciation or insurance. Modified Air Transport Assn. costing method is used.

Supersonic tunnel may unlock combustion secrets

by William Beller

TOMORROW'S powerplant breakthroughs may be hastened by a unique supersonic windtunnel, which enables engineers to study combustion in high-speed flows. In effect, the tunnel puts combustion on a treadmill so that the phenomena can be continuously studied.

For the past two and a half years, a team of Fairchild Engine Division engineers has been developing such a tunnel under contract with the Air Force Office of Scientific Research (Air Research and Development Command). Work was completed last October, and testing has begun.

Sparkplugging the project under the company's chief engineer, Dr. Alfred Gregory, is a young Ph.D., Robert Gross. Gross sees the tunnel as a new research tool that could give answers to fundamental questions in combustion physics and chemistry.

Beneficial results foreseen

Beyond this, if the tunnel could successfully produce a stationary detonation wave or show means for releasing chemical energy in supersonic flow, results such as the following are foreseen:

(1) Appreciably shorter afterburners and ramjets.

(2) Compressors having only two or three stages, which are needed solely for takeoff; for high-speed flight there would be no need to diffuse to low Mach numbers to satisfy burner conditions.

(3) Extremely small and lightweight engines having very high thrust per unit frontal area.

Such improved engines could have far-reaching effects on the performance and economy of military and civil jets, ramjets, and missiles powered by air-breathing propulsion systems.

On the minus side is an increased specific fuel consumption. However, it is felt that in many missions the plus factors would far outweigh the minus ones.

The major advantage of the Fairchild tunnel, unlike shock tubes, is that the facility can be run and observations made continuously, a week at a time if need be. The working section is fully instrumented and the combustion phenomena can be watched through quartz windows.

The tunnel system is designed for steady-state operation. High-pressure air enters the tunnel, is preheated, meets with a gaseous fuel injected downstream of the preheater, reaches Mach 3 at the working section, is water cooled and ejected.

Tunnel size was made large enough to be easily instrumented and yet small enough to have reasonable fuel-flow requirements. Thus, the tunnel test area is a rectangular cross-section approximately five inches high and three inches wide. The throat is about one inch high and three inches wide. It can be cooled by means of

heat transfer to a water jacket.

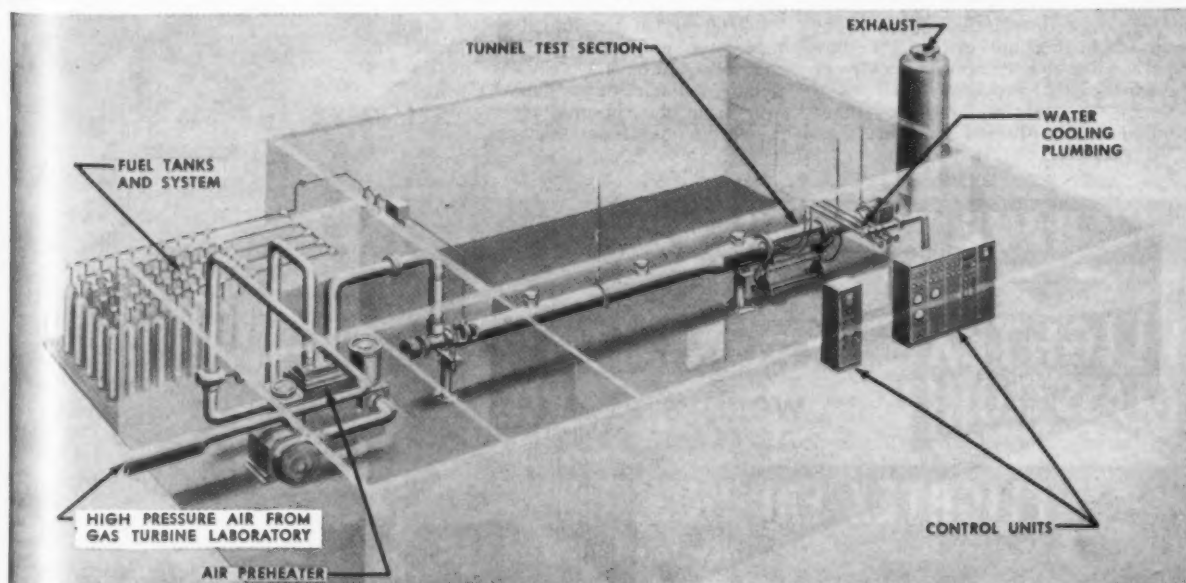
Special features of the tunnel design are: (1) variable inlet temperature operation, up to 1,450°F; (2) variable stagnation pressure operation, from one to ten atmospheres; (3) subsonic premixing of fuel and air; (4) removable test section blocks to permit porous-wall testing; (5) ability to operate as a supersonic free-jet test section; (6) a schlieren optical system specifically designed for this tunnel.

The research program consists of two phases. Phase I, which is completed, called for design and construction of the tunnel, and shakedown and calibration tests.

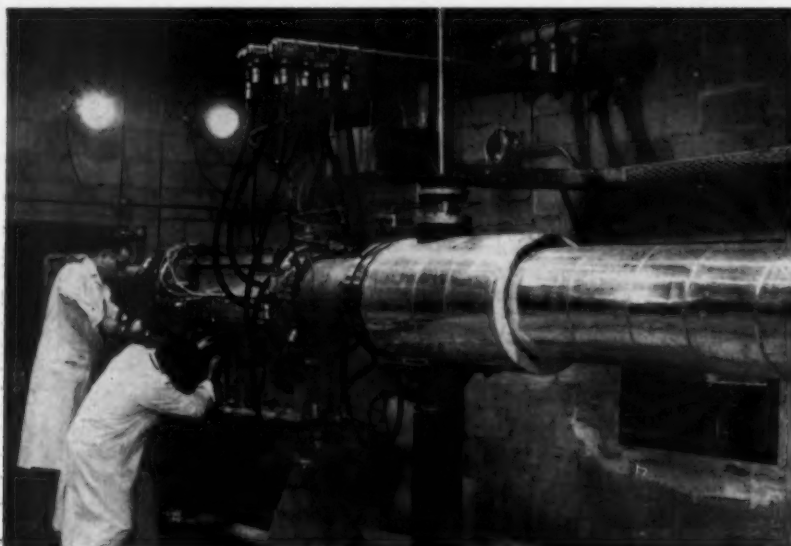
Phase II, which is current, calls for some hot tests with transient fuel flow, tests of a steady detonation wave with bleed, and ignition tests using wedge pilot or spark in the supersonic region.

Four fields of study

Gross points out that there are four major fields of study in which the tunnel can start work. First, there is the study of a standing detonation wave. Such a wave is a shock wave followed by chemical reaction. From an applied viewpoint, a standing detonation wave will release more energy per unit volume per unit time than any chemical burner system known today. This is of particular interest to power-plant manufacturers.



PIPING ARRANGEMENT for Fairchild's supersonic combustion tunnel, which traces out the air and fuel cycle.



TECHNICIANS putting last-minute touches on tunnel's test section.

A second study is that of ignition and flame stabilization. The tunnel in operation develops low static pressures, low static temperatures and high-speed flows. Ignition systems (pilots or spark) contained in properly designed containers (thin wedges) can be used to study the ignition problem in a flow regime not yet explored. In addition, aerodynamic ignition by means of strong shock waves can be explored.

A third study is that of heat transfer. The tunnel is able to withstand high stagnation temperature flows. This permits engineers to get heat transfer data under controlled and confined conditions in a region of high practical interest to powerplant and missile designers.

A fourth possible study is that of flow stability. As an example, a time lag in the chemical reaction rate after the flow passes through a shock wave may produce instabilities. These problems would become evident, if they exist at all and are important, early in the experimental program.

The Fairchild research group that developed this tunnel and will, be

laying out its test work is an advanced scientific team devoted to investigating problems in propulsion and energy conversion. It is a unique group in a commercial company in that its work is not necessarily product-oriented or even deadline-oriented.

The objectives of the group's studies are to advance the state of the art and at the same time look to long-term developments that will protect the company's technical future.

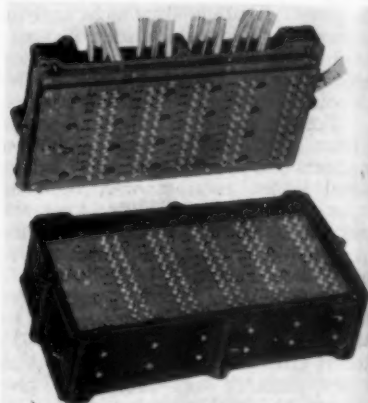
In line with these objectives, the research group is working on problems such as: (1) Magnetohydrodynamics—what happens to strong detonations subjected to strong magnetic fields? (2) Development of ionic and solar power systems. (3) Determination of interaction effects between combustion and supersonic flow, in which the supersonic tunnel will be playing a major role.

Happily, if the tunnel shows that supersonic combustion is practicable, engineers will have a fairly easy job designing suitable powerplants. Change-over from the subsonic regime would merely be one of simplification.

Product highlights

Cole Electric Co. has developed a new plug-in electrical connector designed to make or break any number of circuits simultaneously. It employs a ball-and-socket principle to correct the shortcomings of rigid connectors under high shock and vibration conditions.

Units in production are rated for 50 amps at 30°C rise, qualifying for



vibration of 2,000 cps at 45 Gs in three axes; shock 50 Gs, temperature, -65° to 250°F. Under development is connector having 100 circuits in one panel, 22 in another, making possible 2,200 contacts simultaneously.

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Nutt-Shel Timesaver

Designed to minimize the problems of production or maintenance crews who find it necessary to install plate nuts in difficult and near-impossible locations, a plate nut with a replaceable



threaded element is being produced by the Nutt-Shel Co.

Dubbed the "Timesaver," the plate nut requires only one removal tool, which comes in two sizes, to handle the five most frequently used thread sizes in the nine styles of self-locking nuts.

The replacement procedure is said to require five seconds of one man's time against 10 minutes of time for two men to remove and replace most commonly used plate nuts.

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For other new products, see Reader Service Card.

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RAMAC: United's answer to reservations bottleneck

by Gerald Fitzgerald

DENVER—United Air Lines and International Business Machines have teamed up to develop a "new look" in airline reservation systems and the result of their efforts was unveiled here at the carrier's operating base.

Built around a pair of electronic machines called RAMAC—for Random Access Method of Accounting and Control—it is the first commercial installation of its kind.

RAMAC's chief value to United, according to M. L. Perry, Director of Reservations, will be to increase speed and reduce errors in controlling system-wide reservations as traffic gains each year make reservations more and more difficult to control.

Obviously, many manual operations will be eliminated with the new system as electronic processing takes over, and, Perry contends, time-lags will be reduced by as much as 75%.

The mammoth memorizers—for that's what they really are—are the first two production models of a new type of electronic equipment developed by IBM's San Jose, Calif., plant and are capable of handling 60 million reservations a year. The twin RAMACs keep a running inventory of seats reserved and seats open for reservation on about 1,000 daily flight departures.

Formerly, the method for keeping track of reservations was for each of United's 209 sales offices to report reservations to Space Control in Denver over private telephone and teletype lines. These and any subsequent changes poured into the Denver center and were transcribed on a series

of charts—one chart per flight in daily sequence.

By checking the charts regularly for totals, a "stop sales" message could be sent to all cities served, when a flight neared capacity. Although the method was satisfactory, substantial future traffic gains threatened to render the system inefficient and increasingly inadequate.

With RAMAC, cities continue to report reservations by telephone and teletype, but the form of the message is quite different. Phone messages are received at Space Control as punched-cards and teletype messages as punched-tapes. Tapes are placed in an IBM transceiver, similar to the type that receives the punched cards, and reproduced in card form.

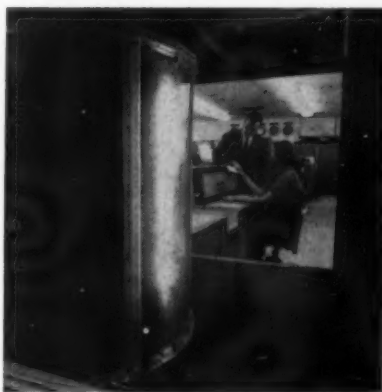
Seven cities, New York, Cleveland, Chicago, Denver, San Francisco, Los Angeles and Seattle, which generate 67% of UAL total traffic, use private telephone lines to transmit reservations, while the remaining 73 cities transmit over leased teletype circuits.

Transceiver and teletype-tape cards are placed in RAMAC and recorded at an assigned position on one of the 50 two-foot wide, stacked discs that make up the machine's memory unit. Information is stored magnetically on both sides of each disc.

An arm moves vertically or horizontally to store data on the discs or to pick up data from the memory, while the discs revolve at 12,000 rpm. Each disc can hold 100,000 characters, and each RAMAC can store 5

million characters. The arm can record or locate information in a matter of milliseconds.

As reservations pour into Space Control in Denver, RAMAC adds the bookings to those previously recorded for each flight and simultaneously computes the new total. When the total



RAMAC's memory unit, drum-like object at left, consists of 50 iron-oxide coated discs, which "memorize" advance reservations on all United Air Lines' flights.

nears the capacity of a particular flight, RAMAC produces a control card identifying the flight and the day on which it is fully booked. Stop sales messages then can be sent to all cities served by the flight so that additional bookings will not be accepted.

The RAMAC operator sits at a control console near the memory unit. Indicator lights show the status of data-processing. The operator may interrogate the machine's memory by means of a keyboard.

When he asks how many reservations have been made to date for a flight three weeks hence, the machine will reply at once with a message on a typewriter in front of the operator—and without interrupting the flow of information passing into and out of the machine.

As yet United has only begun to use RAMAC in reservations, but Perry says that "we are frank to admit that RAMAC has potentialities we are just beginning to explore." RAMAC, by the way, as it is presently set up at UAL, is intended only as an interim measure. A final system will be ready in late 1959 or early 1960. Broader applications may come about at that time.



CHIEF of the Denver Space Control center, Jack Hempstead, asks Anne Schumacher to interrogate RAMAC on the number of advance reservations booked for an upcoming flight. Answer will appear on typewriter above her in less than a second.

'Weathervision' speeds briefings

AIR FORCE and Navy are using closed-circuit television at some installations to relay weather briefings to various sections of these bases.

AF this month demonstrated its installation at Andrews AFB, Md., where one briefing officer provides weather information for 11 stations. Fighter pilots, helicopter and MATS pilots, as well as commanders, can call for weather briefings at any time around the clock. They are given visual information, including weather maps and charts, as well as oral explanations.

Previously, maps were delivered to each of the stations by courier every morning and a weather officer had to be on hand to give pilots briefings before takeoff.

New system was made possible by development of a relatively inexpensive (about \$10,000) TV transmitter console designed by Dage Television Div., Thompson Products, Inc., Michigan City, Ind. Console consists of a Dage camera, a 14-in. monitor and two microphones. Camera, through remotely controlled lenses, can transmit weather maps, facsimile charts or teletype sequences.

When an operations officer wants to give his squadron a briefing, he calls in the TV weather officer, who goes over up-to-the-minute charts and maps, which the pilots see on television receivers. The weather officer can brief the stations one at a time, as he is called, or the entire network. Pilots can

ask questions by way of intercom.

First installation of the system was at Grandview AFB, Mo. (now Richards-Gebaur AFB). Navy's first installation was at Lakehurst, N.J. The "Weathervision" systems also have been installed, or are being installed, at Los Angeles International Airport; Otis AFB, Mass.; McGuire AFB, N.J.; NAS Jacksonville, Fla.; NAS Pensacola; NAS Midway Island; NAS Argentia, Newfoundland; NAS Norfolk; NAS Dallas, and NAS Whidbey Island, Wash.

Arinc committee approves Doppler radar specs

Airlines Electronic Engineering Committee of Aeronautical Radio Inc. has approved a specification for airline Doppler radar.

Adoption of Characteristic 540 was hailed by William T. Carnes, chairman of AECC as indicative of the great airline interest in the new navigation device. Only last May, he pointed out, details of Doppler system were classified.

As adopted, the specifications will call for operation at 8800 megacycles and elimination of complex electronic components from the antenna unit.

No action was taken on computers that might be used with Doppler radars. The present specification calls only for ground speed and drift angle presentation with provision for signal takeoffs for other devices.

Of the nine manufacturers which have expressed intention to build Doppler radars for airline use, six presented schedules for availability of equipment: Bendix—schedule compatible with jet use; Collins—models for airline evaluation in 1959; Canadian Marconi—installing prototype for test; General Precision Laboratory—March 1959; Laboratory for Electronics—Jan. 1959.

Hughes demonstrates automatic production line

Hughes Aircraft Co. has demonstrated publicly a numerically controlled prototype production line of three machine tools turning out parts for fire control systems.

The line, called the nation's "first all-electrically-controlled line of machine tools," includes a horizontal milling machine, 20-spindle drilling machine and a two-spindle boring machine. It has been operating more than a month.

Hughes calls the system "Digitape," claims it will make possible Detroit-type production techniques for the small job lots.

Production designs of both the Digitape controls and the machines, developed by Kearney & Trecker Corp. to Hughes requirements, will be ready for delivery this year.

AMERICAN AVIATION



HEART of Weathervision is the broadcasting console. Capt. William Frey, official weatherman on duty at Andrews AFB, is discussing current weather map. Switches at right tune in any of 11 stations on the base.

WEATHER MAP of North Atlantic is flashed on headquarters receiver as Maj. Gen. Emery S. Wetzel, commander of MATS' Atlantic Division, receives briefing.



Odlum \$\$\$ spur comeback at Titeflex

SPRINGFIELD, MASS.—Titeflex, Inc., a name synonymous with aircraft flexible plumbing since the rollout of the Douglas DC-3, is shaping its comeback.

On the heels of a discouraging skid in post-Korean years (sales dropped from \$15 million in 1954 to only \$6 million last year) Titeflex officials aim to reverse the trend in 1958. By August 31, 1959, end of the company's fiscal year, they expect sales to increase more than 50% to \$9.8 million.

Recovery plan for the 45-year-old firm hinges on three factors: new money, new management and new products.

Under the impetus of financial support from Floyd B. Odlum and the \$135-million Atlas Corp. he heads, the way is fast being paved to provide the tools to shape the comeback and the people to use them.

Although company officials decline to say how much Odlum has earmarked for rejuvenation at Titeflex, it is believed to be in the neighborhood of \$1 million. Today the company ranks as Odlum's fifth largest investment (valued at \$7 million). He holds 96% of its stock, with only 60,000 shares in other hands.

Odlum's first big move at Titeflex was to strengthen its management. In July 1957, Matthew J. Betley, 41-year-old former vice president and general manager of Titeflex's competitor, Aeroquip Corp., was named president.

In the succeeding eight months, Betley has brought to Titeflex no fewer than four other key Aeroquip officials: In August, Daniel W. Ruple, formerly of Aeroquip's production staff, became assistant to Betley.

In September, Dogan Arthur, vp-sales and advertising at Aeroquip became vp of sales at Titeflex. And recently, Jay G. Oesterle and Goerge A.

Lagassa, sales promotion and production specialists in the Aeroquip organization, joined Titeflex as sales promotion manager and vp-manufacturing, respectively.

But all of Betley's "new blood" at Titeflex hasn't come from this one source. S. J. Sovis and Richard Handel have been hired as new purchasing officials with Sovis directing this activity.

Gordon Wygant, with Titeflex since 1941, takes over as aviation sales manager. E. M. Ramberg, another Titeflex veteran of several years, was picked



BETLEY



ARTHUR

by Betley as vp-engineering and Randolph P. Dominic as chief administrative engineer.

With the engineering staff realigned under Ramberg, Titeflex plans to concentrate on product design and development in selected areas. The big job here is to fill the gap being created by a declining market in piston engine ignition harnesses, long a Titeflex stronghold and source of 30% of its business.

To gear for expanded development effort, extensive laboratory facilities in the company's new 40,000 sq. ft. engineering department are being used for evaluation and test of new components for advanced military and commercial aircraft, missiles and rockets.

In one specific area, Titeflex is actively investigating flexible connections for hydraulic systems at greatly elevated temperatures—in the 1,000 to 1,200°F range.

On today's market, it is pitting its Springfield 110 teflon hose assembly against the wares of its competitors.

The approach at Titeflex to the teflon hose development was to design a fitting that would control the "cold flow" of the du Pont material. By calculating the predetermined volume of teflon enclosed in a given space within the fitting, then by compressing the teflon and fitting a predetermined amount, Titeflex's goal was to come up with an assembly that would withstand required burst pressures, with a leakproof fitting, operating over a specified temperature range.

In the Springfield 110, Titeflex says it has the only hose assembly that will completely meet Spec. MIL-H-25579 (USAF) for 1,500-psi systems. It is rated for aircraft use involving extreme temperature conditions of -67 to 450°F and -100 to 500°F in certain instances.

Enclosing the 110 is the company's new Zero-Motion Braid, a Titeflex trademark for a new braiding technique its engineers say will increase flexible hose life by holding elongation and contraction under pressure to less than half of 1%.

On the sales side at Titeflex, it is again a matter of filling the gap left by declining ignition harness output. With teflon and metal hose it has made some headway, its products being in use on the Vanguard satellite, Matador, Thor and Atlas missiles. In the aircraft field, these same products are installed in Boeing's 707 jet transport and in the USAF's KC-135.



NEWEST PRODUCT at Titeflex is its Springfield 110 teflon hose shown as it emerges from specially modified braiding machine which applies Zero-Motion braid.



NEWEST LOOK at Titeflex is this modern new entrance to its Springfield, Mass. general offices. New president Matthew Betley is at left, v.p. sales Dogan Arthur at right.



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APRIL

Business is booming at North Central—here's why

by Eric Bramley

MINNEAPOLIS—"If business was any better, we couldn't keep up with it."

Coming at a time when there's been more gloom than sunshine in the airline industry—and also at a time of much talk about a general business recession—this ranks as one of the most optimistic statements made by an airline executive in many a moon.

But President Hal Carr of North Central Airlines insists it's true. And the facts would seem to support the statement.

As it celebrated its 10th anniversary in February, the nation's largest local service line was booming. Carr's optimism is based on past and present performance and is reflected in future planning. The highlights:

North Central carried 680,930 passengers in 1957—a growth of almost 2,000% over 1949, its first full year of operation.

sengers, only 4,000 less than last July, one of the best summer months. In February, a short month, the total was 52,272. The company has just added four DC-3s, increasing its fleet to 31. Three of the planes are leased from Henry Hill, New York aircraft broker, and one was purchased from Mohawk.

An equipment program is a "must." North Central's 26-passenger DC-3s are too small to handle the demand on many routes. This has forced it to adopt the unusual practice of operating "multiple schedules" out of Chicago—two flights leave at the same time over essentially the same route.

How planes will be handled

Equipment will be handled in three phases:

1. The company has been recom-

sion is made to operate a mixed fleet.

North Central, employing 1,300 people, now operates 3,471 route miles and serves 53 cities through 45 stops in nine states. On file with CAB are applications for 11,386 more miles and 125 more cities. It is, of course, a million to one shot that all these would be granted.

However, if CAB upholds recommendations of its examiner and bureau counsel in two cases now pending, 3,093 miles will be added—almost doubling the system—and 24 new cities will be served.

On Dec. 1, 1957, the airline opened its 404-mile nonstop service between Duluth-Superior and Chicago, one of the major rights gained during its 10-year history. Because of load restrictions, only 16 passengers are carried on the nonstop (two round-trips daily). To break even, eight passengers are required on every trip. The average is now over 11, and the company is clearing \$10,000 a month from the operation.

Why stock was split

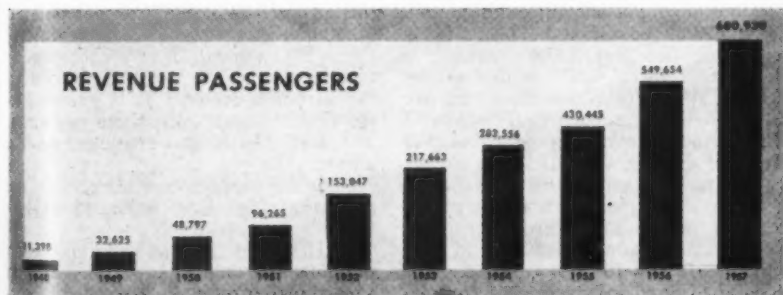
Looking to the future, North Central last November split its stock 5-to-1. In 1954 the stock was selling for \$2. But progress made in the last three years jumped the value to over \$8 by last fall, just before the split. Since then, it has risen to about \$2.50. This is equivalent to a gain of from \$2 to \$13 in less than four years.

Why the split? Reasons were (1) make the stock available to more potential investors; (2) bring price more in line with that of other local lines to facilitate exchange of stock in event of an acquisition or merger at a later date.

Is a merger probable? "The trend has been toward less trunks and local lines," Carr points out. "I see no reason for this trend to change. When our system has matured, we'll take a look to see if a merger would produce operating economies and improved service. But at present we have no merger plans."

The company now has two million shares outstanding. More than 50% are held by Arthur E. A. Mueller, Wisconsin industrialist and chairman of the board. Despite his controlling interest, Mueller maintains a hands-off policy as far as management is concerned. Carr, who owns 4% of the stock, runs the airline.

North Central's current success is all the more noteworthy when it is realized that less than four years ago



Chances are that the 1958 passenger total will be 900,000. If the breaks are good, there's an outside chance that the million mark could be reached.

The airline may be completely free of subsidy in five years.

Each of the last four years has produced a profit. In 1956 North Central had the lowest percentage of airmail revenue (mail pay and subsidy) to total revenue in the industry. It has since received a boost in its temporary rate to cover expanded routes, but officials think the company is still either the lowest or at least among the lowest (1957 final figures aren't available).

Its common stock has jumped in value from \$2 to \$13 a share in less than four years.

A three-phase re-equipment program will be well along toward completion by 1963.

In January—usually a bad month—North Central carried 57,298 pas-

sengers for new routes in two CAB cases. If these are awarded, the DC-3 fleet will be increased to about 40.

2. By mid-1959, larger planes will be bought to supplement the DC-3s. These are expected to be Convair 340s or 440s, for use on the heavier routes. Initial order will be for five, costing about \$5 million with spares. Financing has not been arranged but is expected to include a government-guaranteed loan.

3. More Convairs will be added gradually and by 1963 the fleet will be either all Convairs or a combination of Convairs and a "DC-3 replacement."

Why Convairs? "We need one plane with the capacity to replace two DC-3s," says Carr. "We'll put 48 to 52 seats in a Convair 440, or 48 in a 340." The Fairchild F-27 carries 36 and this isn't large enough for North Central, at least not in the second stage of its program. However, Carr doesn't rule out the F-27, and the turboprop may be considered if deci-

the company was a few days away from bankruptcy. It was at this time that Carr, who left the company in 1951 to join a management consultant firm, returned as president.

Since then, progress has been steady. In 1954, passenger revenue was \$3,351,782. Last year it was about \$7.3 million. And today North Central has:

The lowest break-even need per plane-mile in the local industry. In the third quarter of 1957—latest period available—its need was 16% compared with the industry average of 37.5%.

Second highest airplane utilization—7 hrs. 21 mins. daily. Frontier Airlines is one minute ahead at 7:22. Industry average is 5:58.

One of the reasons for the company's success is management. "We have 'management by exception,'" explains Carr. "Only the exceptional problems ever get to the top. There are four operational vice presidents (traffic-sales, operations, maintenance-engineering, treasury) who have their own budgets and complete authority to do their jobs.

"About 85% of the problems are solved at the working level. Ten percent reach the vice-presidential level. Only 5% reach the president. This allows more time for planning. We don't want vice presidents doing things that a district sales manager or a station manager can do."

No one can put his finger on the precise reason for the booming traffic—especially during the winter months. But Frank Buttomer, v.p.-traffic and sales, points out that North Central has put major emphasis on maintaining and improving community relations. Result: It has a lot of "unpaid salesmen" working for it. Carr also has numerous "presidential advisors"—prominent men in the cities on the system—who have the airline's interests at heart.

Buttomer also says that the big improvement in regularity and frequency of service has promoted business (a flight arrives at or leaves Chicago every nine minutes around the clock). "We're a commuter-type business," he states. "You wouldn't ride a streetcar if it came only twice a day, but you would if frequency was reasonable. The same goes for us."

Jet transport noise being licked—at penalty

The transition from propeller-driven to jet aircraft on the airlines will not be an easy one, Dr. Hugh Dryden, director of the National Advisory Committee for Aeronautics, told a House Appropriations Subcommittee.

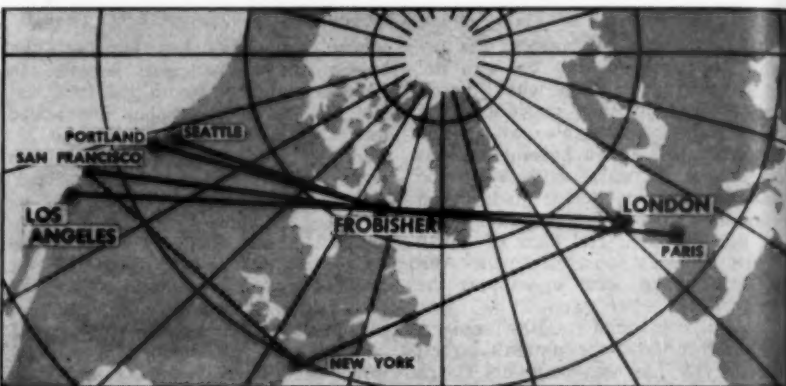
Major problem relates to noise. He said that NACA was working with the Civil Aeronautics Administration in an effort to get ready for the jet era. However, he warned, "You cannot reduce noise without paying a cost

or penalty." As a result there will have to be fewer passengers in the airplane and even then, he said, the noise level will remain fairly high.

On the brighter side, he reported progress with noise-reduction devices and added that work will be continued in this area. NACA is also working to help CAB write the regulations regard-

ing operation of civil jet aircraft.

He said the Air Force had made available a KC-135 tanker so that NACA might do simulated operations of the aircraft in approaches to airports and in wave-offs. Use of the KC-135 was decided on because of similarity to both the Boeing 707 and the DC-8.



POLAR ROUTE is 670 miles shorter than San Francisco-London via New York.

Frobisher: over-the-top refueling stop

A former Eskimo village on Baffin Island, northeast of Hudson Bay in the Northwest Territory of Canada, has become an important adjunct to transpolar airline operations.

Frobisher Bay, now boasting a 7,000-ft. runway and an instrument landing system (ILS), is almost exactly halfway between San Francisco and Paris and has unusually good weather the year around. With ILS, the airport is said to be nearly 100% operational.

While only a dozen or so planes a week now land at Frobisher, it is destined to accommodate up to 500 monthly in the future.

The Canadian government, foreseeing the prospects of tapping the known great mineral wealth of Baffin Island, is ready to spend \$75 million to develop the airport and build a new city.

Ground handling of aircraft presents some temperature problems. Gasoline trucks are kept cold to avoid condensation when fueling an aircraft;

lubricating oil is heated before going into the plane.

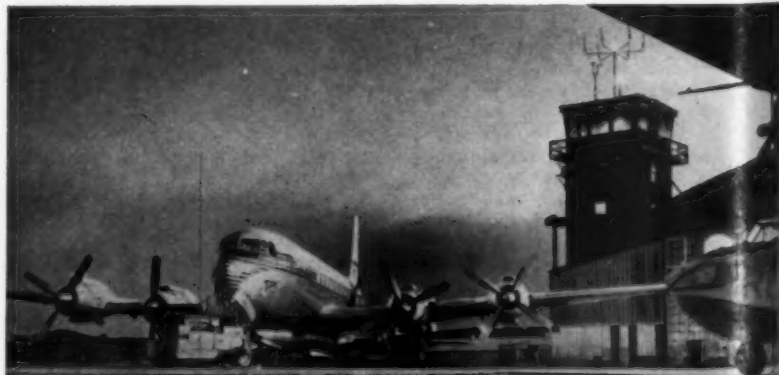
Biggest problem is getting fuel to the airport. Shell Oil Co. has built a 3,360,000-gallon tank a mile away. Fuel is shipped in by oceangoing tankers during the eight to 10 weeks the harbor is ice-free. It is pumped to the tank through underwater pipelines. The fuel then must be trucked to the airport.

Other supplies are barged to the airport at high tide, unloaded at low tide.

The field has an administration building and control tower in addition to airlines' ground handling and storage facilities.

Pan American, TWA and Canadian Pacific are now using the airport as refueling stop on their transpolar routes, with Blue West 8 in Greenland as an alternate.

Norair Ltd. provides once-weekly air service from Montreal.



REFUELING a Pan American DC-7 at Frobisher, where temperature dips to 40 below.

AMERICAN AVIATION

Jet age problems worry unions

Airline labor unions look toward the swiftly approaching jet age no less apprehensively than other major aviation groups charged with the planning and preparation for commercial jet operations.

The airlines' general lack of experience with jets, and similar lack of certain knowledge of their capabilities make predictions of manpower needs difficult and labor's position uneasy. Current pilot-flight engineer controversy has resulted largely from this situation.

The Air Line Pilots Assn., which represents most airline pilots, is presently negotiating for at least 16 new contracts. Of these, all but two have required the assistance of the National Mediation Board. Western Air Lines' pilots went on strike midnight Feb. 21.

The Flight Engineers' International Assn. is the principal representative of airline flight engineers and is now negotiating for about seven new contracts. The National Mediation Board is aiding with four negotiations.

The International Assn. of Machinists, to which most airline mechanics belong, is involved in contract negotiations with at least 11 airlines. All but one contract is in dispute. White House-appointed fact-finding boards are at work with seven airlines and the IAM to iron out disputes. NMB is assisting three other airlines and their mechanics to come to an agreement.

Major fear of labor seems to be the old one that accompanies technical advance in any field: that with the

increase in equipment productivity there will be a proportionate decrease in manpower requirement. How true this will be in jet air transportation no one really can predict as yet. But the probability of some realignment makes all labor groups uneasy.

ALPA, say the flight engineers, is trying to avoid possible pilot layoffs by attempting to take over the flight engineer slot aboard jet aircraft. Pilots have been asking that the third crew member be pilot-qualified. The move by ALPA has gained considerable headway over the past two years and reportedly has become one of the major issues in most airline pilot contract talks today. It has met resistance from the airlines and even from some pilots.

WAL termed this pilot demand "featherbedding" and American Airlines told its pilots: "We can no more make a change in the engineers' agreement without their consent than we could make a change in the pilots' agreement without your consent." Indications are that all pilots do not agree with current ALPA strategy and rumblings are audible among pilots of at least two major airlines.

American recently became the second carrier to sign a jet contract with the flight engineers, the agreement to extend for five years with pay issues to be reopened at the end of three years.

Labor's worry is a real one though, and recent demands by the mechanics trying to anticipate layoffs support this view. IAM is asking for, among other

things, contractual provisions for severance pay, which would extend from two to ten weeks depending upon the length of service.

With regard to labor's fear of jet-age layoffs, Bureau of Labor Statistics' Monthly Labor Review for November predicted, perhaps over-optimistically, substantial increases in airline manpower requirements through 1956-60. Predicted increases showed a lag, however, through 1958.

Perhaps in response to labor feeling along these lines, George R. Petty, FEIA president, recently said: "In the next few years there will be a period of layoffs as the jets are introduced. If the airline business picks up as most airline leaders expect it will, then these layoffs will be only temporary. However, there will still be men out of work for a time. Along these lines we have called a conference of all labor leaders in the airline industry."

Conference will be held in Washington April 17.

Defense Dept. defers sale of surplus C-46s

Dept. of Defense has deferred a plan to sell 112 surplus C-46 aircraft on the open market on the recommendation of the Business and Defense Services Administration of the Dept. of Commerce. Next sale was scheduled for April 10. Method to be used in the disposal of the aircraft is now being studied by Defense and Commerce departments.

The Business and Defense Services Administration, which advises the Defense Dept. on sales of surplus property and makes recommendations based on the impact sales would have on private markets, heard representatives of airlines, air associations and aircraft modification concerns.

The industry spokesmen urged deferment, or even abandonment, of the plan, for at least a year or 18 months when, it was felt, improved business conditions would permit the aircraft to be disposed of without repercussions in private industry.

Riddle Airlines pleads for increased mail pay

Riddle Airlines, claiming that its very existence is at stake, has urged the Civil Aeronautics Board to grant it subsidy relief "until present depressed economic conditions improve."

In its proposal for mail pay and subsidy, the certificated all-cargo carrier held that the "Civil Aeronautics Act does not intend that the Board stand by in witness of the quiet expiration of the certificated all-cargo industry, carrier by carrier."

"CAB," the airline continued, "must provide mail pay sufficient to meet the 'need' under honest, economical and efficient management—it is not a matter of choice for the Board."

Box score of current labor negotiations

Airline	Pilots	Flight Engineers	Mechanics	Stewardesses, Purser
American	N	—	—	—
Bonanza	N	—	—	—
Capital	—	—	N (P)	C
Caribbean Atl.	N	—	—	—
Central	—	—	N	—
Continental	—	N	—	—
Eastern	N (P)	N (P)	N (P)	—
Flying Tiger	N	N	N	C
Lake Central	—	—	—	C
Mohawk	—	—	C	—
National	—	—	N (P)	—
North Central	N	—	—	N
Northeast	N	—	N (P)	—
Northwest	—	C	N (P)	N
Ozark	N	—	—	C
Piedmont	N	—	—	—
Seaboard & Western	N	C	—	—
Slick	C	—	—	—
Southern	N	—	—	—
Pacific	C	—	—	N
Trans-Texas	N	—	—	N
TWA	—	N	N (P)	—
United	—	C	N (P)	—
West Coast	N	—	—	—
Western	N (S)	—	N	—

C—Contract open now and subject to negotiation, or request has been made to reopen contract discussions.

N—National Mediation Board has had request for its service in the case or has rendered service in the case.

N(P)—Contract disputes now being considered by presidential fact-finding boards.

N(S)—Now on strike.

Board and ALPA clash on crash

CAB and the Air Line Pilots Assn. have disagreed as to the probable cause of a Northeast Airlines DC-3 accident on Sept. 15, 1957.

In a formal report, CAB said that the accident, which occurred during an ILS approach to New Bedford, Mass., was probably caused by an attempt by the pilot "to make a visual approach by descending prematurely in the approach area without adherence to the prescribed ILS approach procedure which was dictated by existing weather conditions."

However, ALPA's accident investigation committee disputed the finding and said it was more inclined to fix the primary cause as "erroneous altitude information."

Twelve persons were killed in the accident, including Capt. V. L. Pitts and copilot R. W. Sweetland.

Four carriers face query on realistic scheduling

Civil Aeronautics Board has decided to investigate so-called "realistic scheduling" complaints filed by the Agency's Compliance Office against American, National, United and Trans World Airlines. All the carriers had argued for dismissal of the complaints.

Simultaneously, the Board agreed to grant an American motion calling for a prehearing conference on the problem but set no date.

Capital gets go-ahead for group excursion rate

Capital Airlines has received authorization to offer new group excursion fares. With Civil Aeronautics Board approval, Capital may now offer groups of 25 or more roundtrip fares at 160% of one way first-class fares instead of the usual 190%.

Fares will apply to roundtrip travel from specified points on the Capital system to Washington or New York. Carrier will be permitted to split the groups on separate flights but not into units of less than 10.

New rights recommended for Trans-Texas

Trans-Texas Airways has received initial endorsement for a major route adjustment in the South Central Local Service Case.

CAB Examiner Joseph L. Fitzmaurice recommended the Houston-based carrier for entry into New Orleans and a new Houston-Memphis route which would be effective until Dec. 30, 1962. Simultaneously, he favored the addition of Greenwood, Miss. to the Southern Airways system and a five-year suspension of Delta Air Lines service at the Mississippi point.

INTERNATIONAL

New York to Geneva by turboprop

by Anthony Vandy

GENEVA—Gas turbine power got me almost all the way here from Washington. Apart from Eastern's Super Constellation which delivered me to Idlewild it was turboprops all the way along the line: Britannia from New York to London, Viscount from London to Paris and again from Paris to Geneva.

Question No. 1 from anyone who hasn't ridden a Britannia is "What's it like?" Although the big Bristol transport has been in passenger-carrying service for some 14 months, it has not been seen very much in the Western Hemisphere. This winter BOAC and El Al had about four weekly transatlantic schedules with Britannias, while Aeromexico de Mexico operated a daily Mexico City-New York flight with Bristol turboprop equipment.

Most Britannia operations to date have been those by BOAC from London to Africa, the Far East and Australia. Only this month (April) is BOAC introducing the Britannia to North American cities other than New York.

Well, what is it like? The first answer must be that it is fast. Bristol's advertising has never particularly stressed the aircraft's speed but it is unquestionably faster than any piston-engine transport. My particular flight took less than 9½ hours from Idlewild to London. There were no particularly favorable tailwinds and no power above normal was being pulled from the Proteus engines.

Second important point about the Britannia is its spaciousness. Make no mistake about it, the Britannia is a big aircraft—it grosses no less than 180,000 lbs. for takeoff. The breadth of the cabin is such that two-and-two seating makes the aisle seem almost wide enough to drive a jeep down it. Inci-

dentally, the installation of two galleys—one at the front and one at the rear—is a definite advantage to both cabin personnel and passengers. And, while on the subject of the Britannia's cabin, it is worthwhile mentioning that the toilets are of the flushing type.

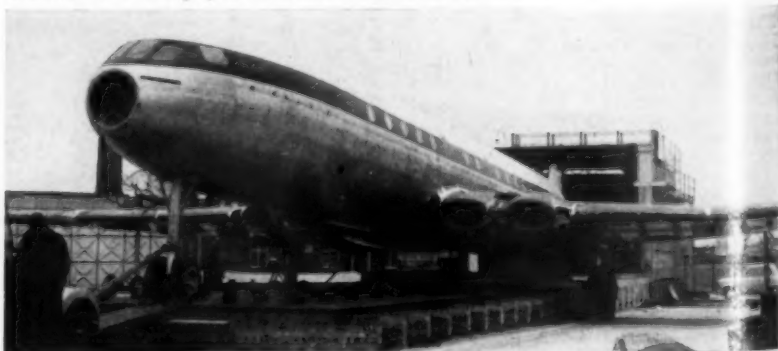
However, on my particular flight both the rear toilets and wash-basin faucets had frozen up prior to takeoff and never unfroze.

Third point in the Britannia's favor is its excellent range. This feature used to be advertised extensively but more recently Bristol has tended to stress the aircraft's suitability for medium-short-haul routes. However, it is a wonderful aircraft for long stages, as several non-stop proving flights have shown.

It is difficult (and probably invidious) to compare the Britannia's range/payload characteristics with those of its two chief competitors—the Douglas DC-7C and the Lockheed L-1649—without the use of charts. Suffice it to say that the Bristol turboprop transport seems capable at least of holding its own against any piston-engine aircraft.

The noise level of what BOAC calls "The Whispering Giant" proved to be low but not too much different from that of the latest piston-engine transports. Vibration was very noticeable in several parts of the cabin. It seemed that not as much sound-proofing and anti-vibration material is used in the Britannias as in American piston-engine aircraft. In this regard I can't help wondering whether Vickers, too, isn't skimping in the use of such material in the Viscount 800 which to me seems noisier than the 700 series. Or is it that more power is being pulled from the Darts than in the earlier version? Or am I just imagining things?

Comet 4 ready for test to destruction



SECOND COMET 4 off the assembly line at de Havilland's Hatfield (England) plant is shown shortly before start of water tank tests to destruction. Tank is being built around fuselage. Tests will determine fatigue life of materials and structural parts.

PEOPLE



PARKINS



MUHLFELD

Wright A. Parkins has been named vp-engrg. of United Aircraft Corp. and **Leonard C. Mallet** vp in charge of all Pratt & Whitney Aircraft Div. operations. Parkins has been with United since 1928, Mallet since 1929. Parkins is former vp in charge of P&W, while Mallet was gen. mgr.-P&W Connecticut operations.

John E. Muhlfeld appointed vp-sales for Air Express International. Muhlfeld has been in freight field 26 years, most recently as vp-sales and traffic for Slick Airways.

Stig Anderson, Jorgen Maehl and **B. John Heistein** have been promoted by Scandinavian Airlines System. Heistein moves from central reg. sales mgr. to gen. sales mgr., Anderson from tariffs and schedules mgr. to gen. traffic mgr., and Maehl from asst. to vp to central reg. sales mgr. for U.S.

W. C. Bruner named dir.-maintenance and engrg. for National Airlines. Bruner has been with National 19 years, most recently as mgr. aircraft overhaul.

Roger W. Mullin, Jr. elected secy. and **Frank H. Miller** treas. of Curtiss-Wright Corp. Mullin is former asst. secy. and corp. counsel and Miller was former asst. treas. and insurance mgr. for Curtiss-Wright.

Richard J. Davis named Washington, D.C., pub. rel. rep. for Douglas Aircraft Co. Davis was formerly with Newsweek Magazine as Pentagon correspondent and Washington bureau mgr.

Peter J. Wacks, former asst. to pres. at Bell Aircraft Corp. elected asst. vp. He will be in charge of plant protection and security, labor relations, personnel operations, medical, safety engrg., training and employe feeding service.

Peter D. Brennan appointed asst. to vp-traffic of Allegheny Airlines. He was formerly assigned to Allegheny's customer relations dept.

John F. Strickler named asst. to vp and gen. mgr., Pilotless Aircraft Div., Boeing Airplane Co. He formerly was research mgr. with Bell Aircraft Corp.

Dr. John Mason, former sr. project engr. with The Garrett Corp., has been appointed chief, preliminary design for Garrett's AiResearch Mfg. Div.

R. T. Kurt was recently made coordinator of VTOL for Grumman Aircraft Engrg. Corp. His former position as dir.-quality control is taken by **Brian D. Evans** of mfg. engrg.

A. E. Raymond is named chairman of Douglas Aircraft's engrg. council. Serving with the Douglas vp-engrg. will be **E. F. Burton**, Santa Monica; **E. H. Heine**, El Segundo; **E. P. Wheaton**, chief miss es engrg.; **C. C. Wood**, Long Beach; **C. E. Strang**, Tulsa, and **R. L. Hoskinson**, dir.-testing div.

A. M. Collins made sup't ticket sales offices for United Air Lines. Collins was former job evaluation supt.

Vincent Moore joins Hamilton Standard Div. of United Aircraft Corp. as design chief. He was previously asst. design chief engr. for Wright Aero Div., Curtiss-Wright Corp.

Chris E. Muzetras named admin. asst. to vp-sales for Northwest Orient Airlines. His prior position was supvr.-sales statistics.

Frank J. McArdle becomes dir. pub. rel. for Avis Rent-A-Car System. Before coming to Avis, McArdle was dir. pub. rel. for American Machine & Foundry Co.'s Electronics Div.

Charles A. Bucks, Continental Air Lines' sales promotion mgr. named passenger sales mgr. Also at CAL, **Brad P. Bartow** promoted to asst. gen. traffic mgr. and military liaison. Bartow is former mgr. military sales.

Jack M. Beauchamp named dir. field service for Aerojet-General Corp. He is former dist. mgr., customer relations office, New York.

Don T. McKone, Jr. appointed vp-gen. mgr. of Marman Div., Aeroquip Corp. His last job was vp-gen. mgr., Industrial Div.

Albert S. Walker and **Joel Daniels** named Northeast Airline vice presidents. Walker will be vp-services and Daniels vp-adv. and promotion. Prior to the new appointments, Daniels was Capital's vp-adv., Walker was a Worcester, Mass. station mgr.



SQUIER



ELAM

Carl B. Squier, Lockheed Aircraft Corp. vp, to retire Apr. 17. He joined Lockheed in 1929 when it was a division of Detroit Aircraft Corp.

Dr. D. W. Elam elected vp Hiller Helicopters, following Hiller acquisition of Adhesive Engrg., headed by Elam. He will continue to run Adhesive Engrg.

RAdm. John E. Wood (ret.) appointed asst. to pres. Kellett Aircraft Corp. Most recently, Wood was township commissioner for Cheltenham, Pa.

Frank Miles, vp The Garrett Corp., is given charge of all company sales. Miles was one of the first five men on the staff of The Garrett Corp.

R. W. Rummel, vp-engrg., Trans World Airlines, appointed chrm. of TWA's Jet Planning Committee.

F. W. Newman appointed mgr. aircraft product service, General Electric Co.'s Instrument Dept. Prior job was engine instrument sales specialist.

Richard E. Cross, formerly supt.-govt. contract aircraft maint. dept., becomes dir. aircraft maint., Skymotive, Inc.

John F. Strickler named asst. to vp-gen. mgr. of Boeing Seattle Div. Strickler is former mgr. Bell Aircraft Corp.'s research div.

Joseph E. Linnell becomes mgr. system operations, AAXICO Airlines, Inc. Linnell previously was administrator-sales and operations for Meteor Air Transport.

N. A. Keller announced as project engr. for Lockheed Aircraft Corp.'s Jet-Star. He was former B-47 project engr.

TRANSPORT CHANGES

Michael J. T. de Tarnowski appointed Washington, D.C., reg. mgr. Sabena Belgian World Airlines.

Probyn W. Aitken named research asst. at Northwestern University's Transportation Center.

C. W. Cronin becomes Atlantic Region dir.-properties for Trans World Airlines.

Bob Gibson to run Lufthansa Airlines' new Boston office; **Gerhard Kemper** named to manage Philadelphia office; **Dimitri Petroff** appointed Caribbean sales mgr.

Charles Mueller appointed asst. to dir.-dining and commissary service for Trans World Airlines.

James R. Kelly becomes dist. sales mgr. for Northwest Orient Airlines, Taipei, Formosa; **Russell G. Collins**, St. Paul gen. sales mgr., resigns.

Eric Versteegh appointed dist. mgr., Denver, Colo. for KLM Royal Dutch Airlines.

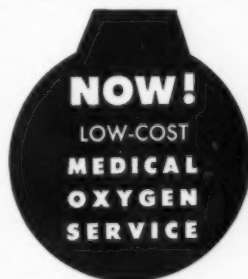
Charles E. McGee, of Mel Adams and Assoc., Inc. will be acct. exec. for Irish Airlines.

Abner Sundell made purchasing agent, Overseas National Airways.

John Lane appointed publicity rep. for Braniff Int'l Airways in New York City.

John P. Van Coevern made mgr. of American Airlines' New York reservations dept.

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Unit consists of a single-stage, constant flow regulator; cylinder pressure gauge; outlet flow gauge (calibrated in litres) and 2 standard airline outlets. Attaches to any high pressure aviation oxygen source or Puritan "E" medical cylinder. Puritan lightweight aluminum cylinder stand available at low-cost.

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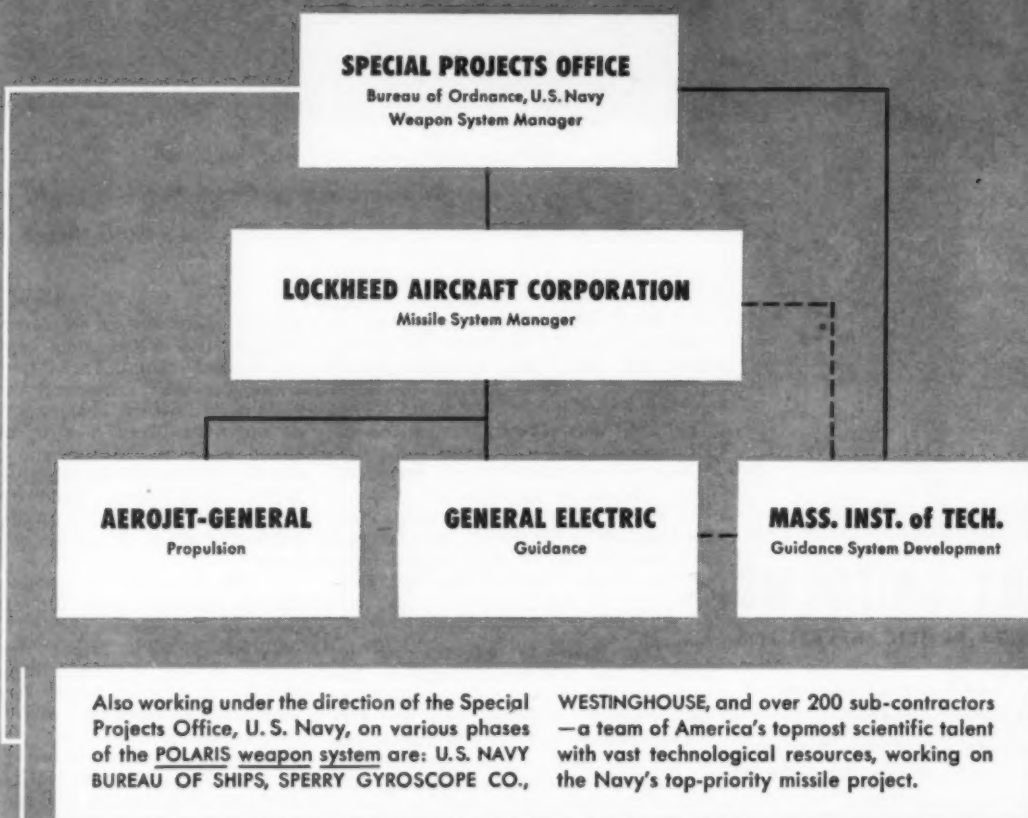
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SAM SAINT SAYS

Rough approach at Cincinnati—a flight director would have helped

WE HAD BEEN on the ground at Cincinnati just 10 minutes. The ceiling was 300 feet, the visibility three-quarters of a mile, exactly the legal minimum for a heavily loaded DC-6. The wind was directly across the instrument runway at 12 knots and gusty. It was daylight. Should have been a relaxed approach, but it wasn't.

Our flight was a nonstop from La Guardia to Cincinnati. The forecast at Cincinnati: 3,000 feet with five miles and light rain. Our alternate was Dayton.

Less than 40 minutes out we learned the Cincinnati weather had gone to 300 feet and one mile with rain—ceiling variable, 200 to 400; visibility variable from one-half to one and a half miles. Question: What was happening at Dayton, our alternate, our safe out if we couldn't land at Cincinnati?

A quick check brought the entire crew to attention. Since our check 15 minutes before, the rain had started at Dayton. The ceiling had dropped from 7,000 feet to 700 feet with a marginal three-quarters of a mile visibility. The area of rain and low ceilings was spreading east faster than anyone had expected. Cleveland was still wide open, but Pittsburgh had started to drop rapidly.

Meantime we had other problems. Twenty minutes out of Cincinnati, the wind shifted, giving us unexpected changes in drift angle and speed. This necessitated some fast double-checking with other navigational aids. The temperature was 30° and we were picking up a little ice.

Radar approach control identified us and gave us a vector. This was relaxing; almost too relaxing. He advised he was turning us close in onto the ILS final to avoid an area of heavier rain where he would lose us on his scope. The brief period of relaxation was suddenly over as I realized his final turn was taking us through the ILS—through it so close to the outer marker that the ADF stood still as we bent around to get back. We were making a pylon turn around the outer marker.

Should we abandon the approach for a new start? Let's hang on a few

seconds more, maybe we can bring the swinging ILS needle under control. Get the descent started. Three green lights, we've got wheels. The check list is complete except for the heaters and the rest of the flaps. Keep heat in the windshield or it might fog up. The ILS needle is coming back slowly. Maybe. We're at 600 feet. Hold on a few seconds more. The ADF on the middle-marker is about 5 degrees left of the nose.

The ILS is not quite centered, but it's steady. Good. We can go on down to 300 feet.

The co-pilot calls: "Runway in sight!" We are a runway width to the left. Needs a quick sashay to get over. A burst of power. Will this worry the passengers? Probably not more than pulling out from a missed approach. Anyway it's done now. Not too rough. Reverse. Easy on the brakes.

No one but another pilot—a big ship pilot, with 50 or maybe 80 passengers aboard—can know the intensity of concentration, the heavy mental responsibility of those last seconds on a rough approach. That is why pilots plead for better electronic aids and better approach and runway lights. So why has it taken so long to get the flight director system into use?

About 10 years ago this reporter first flew a flight director system. A little box of electronic tricks is added to the ILS localizer and glide slope receivers. The harassing mental gymnastics are all neatly resolved in the black box.

The pilot banks the airplane to zero a needle and keep it centered. My engineer (who flies his own lightplane) could have completed the approach at Cincinnati with no strain.

Years ago an Air Force evaluation not only proved the important reduction of pilot workload, but demonstrated that approaches on a flight director system were far more accurate. Converting missed approaches to successful approaches should pay for the airborne equipment. Added safety would come as a bonus.

After the approach at Cincinnati I wondered once again why airlines still have airplanes delivered in 1957 without a flight director system aboard.

TRANSPORT TRENDS

Airfreight business is booming. Current prediction is that 1958 volume will be more than 18% ahead of last year. First quarter showed 18.19% jump in shipments picked up and delivered—despite poor weather and business recession.

Another major airline route case—a southern transcontinental—has been started by CAB. And in view of recent route awards to Florida (see page 50), it will be a major battle. Eastern and National gained little but added competition in Florida case, will go all-out for transcontinental. This will be the second southern transcontinental hearing. In 1951, CAB turned down examiner's recommendation that EAL get a southern route, decided instead to rely on interchanges.

Capital Airlines has quietly called off the three-month moratorium granted it by British financial interests on Viscount payments. Company brought payments up to date with \$2.5-million short-term line of credit from Chase National Bank. British granted January-March moratorium because of Capital's poor financial condition, but insisted on restrictive rewriting of chattel mortgage on planes, plus higher interest rate. Since then, General Dynamics has agreed to help in refinancing the \$48-million Capital debt. British loan was returned to original status so there won't be any restrictions to interfere with the refinancing. Line of credit with Chase was possible because of company's improved condition following interim fare increase.

White House planners have set their timetable for preparing legislation for the Federal Aviation Agency. Research and preliminary work will take the next five months. Actual legislation will be drafted about September. Comments will then be received from interested government departments. Deadline set by Congress for submission of legislation is Jan. 15, 1959. Incidentally, present idea of planners is that FAA should be an independent body headed by one man of sub-cabinet rank with no military background.

Airline lawyers who are chafing over slowness of CAB's passenger fare investigation point out that CAB attorneys are now spending weeks cross-examining company witnesses on 1958 forecasts. They claim this is time wasted because by the time the fare case goes to the Board for decision, actual 1958 results will be available.

Airlines are preparing for big battle over proposed aviation gas tax hikes—airways user charges. Commerce Dept. proposal, duplicating President's budget message, has been sent to House Ways and Means Committee and Senate Finance Committee. It calls for ½¢-a-gallon tax hike effective July 1, 1959, and elimination of present 1¢ refund to airlines. Tax would then rise ¾¢ annually to a total of 6½¢ in 1962. Jet fuel tax would be the same.

Administration's pitch is that cash must come from somewhere to finance expensive air navigation equipment, and that airlines should be substantial contributors. If the bill were to clear Congress, Commerce anticipates revenues of \$211,300,000 by 1962. Prospect is for an all-out fight.

American Airlines now expects to have jets and turboprops in service before end of 1958. Company originally planned start of jet service for June, 1959, then advanced it to March, then to January. It now says Boeing 707s and Lockheed Electras will fly regular schedules this year. AA will also make decision this year on purchase of medium-range jet.

Record transatlantic travel is forecast this summer by the two U.S. flag carriers. Pan American's April-May bookings are ahead of last year, June is up 20%. Company is scheduling its largest transatlantic summer lift. TWA reports 60% increase in April-October bookings, says new economy class fare is largely responsible.

TRANSPORT At Deadline

More competition to Florida; four carriers get key routes

Any prospect that shrinking airline profits might alter Civil Aeronautics Board's thinking on increased competition has been erased.

In a far-reaching decision emerging from its consideration of three major route cases, CAB opened the door to the lucrative Florida market to three additional carriers: Capital, TWA and Northwest.

It also extended service of a present Florida carrier, Delta, to the North.

As a result of the new decision, only two transcontinental trunk carriers—United and American—are now without Florida service. And of the remaining 10 trunks, only two other regional airlines—Western and Continental—reap no direct benefit from peak vacation traffic to southeast.

Here's how airlines fared in the 4-to-1 "press release" decision which saw member Chan Gurney cast the sole dissenting vote on all but the Delta awards:

Capital—Florida-to-Buffalo, Cleveland, Pittsburgh route. Its route 51 is extended from Atlanta to Miami via Jacksonville, Tampa-St. Petersburg-Clearwater and West Palm Beach, and from Pittsburgh to Buffalo via Youngs-

town, Akron-Canton, Cleveland and Erie. (Major restrictions: no service from west of Cleveland to points south of Atlanta and no single-plane service from south of Atlanta to cities on its present route to Washington, Baltimore, Philadelphia and New York).

Delta—Has Florida-Cincinnati route extended northward to Detroit via Dayton, Columbus and Toledo. Flights serving new cities must begin or end at or south of Atlanta. Also, Delta adds Orlando, Tampa-St. Petersburg-Clearwater and West Palm Beach to its route north to Great Lakes area.

Northwest—Wins Chicago-Florida service via Atlanta and Tampa-St. Petersburg-Clearwater. Permits NWA single-plane service from these points via Chicago to Milwaukee, Minneapolis-St. Paul or cities to west.

TWA—Gains St. Louis-to-Miami route via Nashville, Atlanta and Tampa-St. Petersburg-Clearwater with allowed single-plane service from Florida to points west of St. Louis (such as Kansas City, Los Angeles and San Francisco) provided flights stop at St. Louis.

Before the new decision, Florida service was shared by Eastern, National, Delta, Northeast and Braniff, although the latter's Florida service is restricted

to its international operation.

Hardest hit by the new awards is Eastern. Its services to the south now become duplicated at Chicago and more competitive at St. Louis, Cleveland, Pittsburgh and Detroit—all key traffic points that rank among the top 12 cities in the U.S. in population. Eastern's only grant in CAB's decision was an extension of its route 6 westward from Charlestown, W.Va. to Cincinnati and Chicago.

New ticketing rules aimed at international 'no-shows'

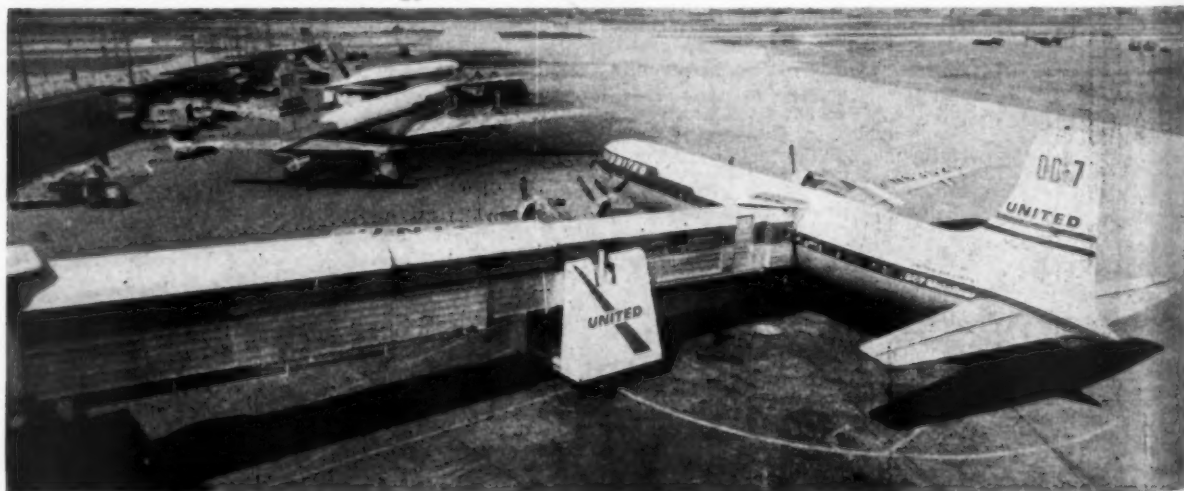
New ticketing time-limit and reconfirmation rules for international passengers became effective April 1. Affected are all international passengers traveling on airlines serving U.S., Canada, Mexico and Cuba. New rules, basically similar to those already in effect within the U.S. and Canada, are aimed at eliminating "no-shows."

New time limits require that passengers who book space more than three days before flight departure buy their tickets no less than 72 hours beforehand, or within 48 hours after the airline has confirmed the reservation, whichever is sooner. If space is booked within 72 hours of departure, passenger must pick up ticket as soon as practicable after space has been confirmed, actual time to be agreed upon by passenger and ticket agent.

Reconfirmation rules require passengers reconfirm continuing or return reservation at least six hours before departure unless stopover is less than 12 hours.

Westbound passengers from United Kingdom, Ireland or Europe must reconfirm not less than 48 hours before departure, unless stopover is less than 48 hours.

United introduces "Aero-Gangplank" at O'Hare



A NEW METHOD of getting passengers to and from terminals is being used by United Air Lines at Chicago's O'Hare Field. The "Aero-Gangplank" (AMERICAN AVIATION, June 17, 1957, p. 86) is a telescoping, three-section ramp with one end affixed to terminal, other to mobile unit that moves plank to and from plane. The unit, now in regular service, was designed by Lockheed Air Terminal, Inc., Burbank, Calif. Plane end can be elevated from minimum of 4½ ft. to 13½ ft., allowing use with many types of aircraft. Ramp will extend to 107 ft.

Pan American gets set for opening of transatlantic jet service

by Eric Bramley

Decisions on a number of the operational problems connected with opening of transatlantic jet service later this year have been made by Pan American World Airways.

There are, of course, some areas in which details remain to be ironed out, but in general PAA has a good idea of how the flights will operate—crew complements, flight planning, navigation, ground handling, etc.

One proposal being considered—and not yet final—involves an answer to the vital question of how to handle fuel-hungry jets when it is necessary to "hold" during instrument weather.

At a jet seminar in New York, PAA revealed some of the details of its planning.

Service will be operated initially with Boeing 707-121s, powered by Pratt & Whitney J57 engines. These will operate nonstop from the U.S. East Coast to European points. Westbound, however, a stop normally will be made at Gander.

One requirement that PAA gave manufacturers was that its airplane must be capable of operating nonstop Paris-New York with a full tourist payload. The 707-121 does not meet this requirement. The more powerful J75-powered 707-321s and Douglas DC-8s, on which deliveries start in the summer of 1959, will operate the route nonstop when they replace the 121s.

Operational procedures

In order to conserve fuel, PAA's jets won't leave the blocks at the terminal building until they have been given a takeoff time. Following takeoff, PAA's experts say they prefer to allow the plane to "drift up" to its optimum altitude as it burns off fuel and loses weight.

However, because of air traffic conditions, it may be necessary to stick to the "step-climb" method. On short flights, single-level cruise will be used.

From a wind standpoint, and to take maximum advantage of the jet-stream, a cruise level of about 32,000 ft. is the best, said Capt. C. S. Vaughn, chief pilot of PAA's Atlantic Division. Eastbound crossings will be somewhat "straightline" at about 50 degrees latitude, while westbound flights will be farther north.

Still under discussion are approach and landing procedures. Ideal letdown is considered to be 1,500 feet per minute to an altitude of 2,500 ft. at the threshold. For passenger comfort, PAA prefers not to descend at more than 3,000 ft./min. under any conditions.

On the question of what to do with a jet when it has to "hold" in instrument weather, PAA revealed some details of a proposed new procedure—which is not final because it has not

yet been discussed with CAA.

The procedure includes a "super stack" for jets, separate from the piston-engine stack. To conserve fuel, the jets would not be stacked at less than 20,000 ft. Although separated from the piston-engine stack, they would hold a theoretical position in that stack. When cleared for approach, they would proceed directly to the threshold at 2,500 ft. and land.

Time required to leave 20,000 ft. and reach the threshold will be 11 minutes. And PAA estimates it will be able to hold a jet at 20,000 ft. for one and one-half hours and still have fuel to reach an alternate.

In selecting its jet crews, PAA has followed direct line of seniority, and so far no pilot has turned down a jet job, Capt. Vaughn said. Average age of the pilots who will initially fly the new aircraft will be 45 to 50.

A transatlantic PAA crew will consist of captain, first officer, flight engineer and navigator (the latter also has pilot training). This is smaller than the crew on a DC-7 which, because of longer flight times, includes three pilots, a navigator and two flight engineers.

Before transferring to the jets, a pilot will attend ground school for 20 working days, receive eight hours of "static" training in the cockpit, followed by eight to 10 hours of flight training, including about 20 landings and take-offs.

PAA also revealed that:

Its jet fuel will probably be kerosene, which develops more BTUs per

gallon than JP-4. Fuel contracts have not yet been signed.

Water for the water injection system used during takeoff of the 707-121 will cost about 3¼¢ per gallon in large quantities.

It is making provision to carry a spare engine slung under the wing of the 707-321 and DC-8. If a plane encountered engine trouble at a remote point, a new engine would be delivered on the next regular flight. This eliminates the need to store the expensive engines at many points on the system.

Sound suppressors on the jets are expected to achieve a reduction of "somewhat better than 6 decibels."

Because of the weight penalty and added cost, preloaded containers will not be used for baggage.

BOAC to give engineer full station in Britannias

British Overseas Airways Corp. has decided to return all its Britannia 312 turboprop transports to Bristol Aeroplane Co. for installation of a fully equipped station for the flight engineer.

Originally, the Britannia was designed as a two-crew plane—pilot and co-pilot only. In tests, Bristol carried a flight engineer, and his workload proved such that it was decided to equip production airplanes with a third seat in the cockpit, similar to that in the Douglas DC-7.

In actual airline service, BOAC found that the need for a flight engineer could not be filled adequately with the "jump-seat" arrangement. Hence, the major modification.

Along with the new flight engineer's station, a high-density passenger seating arrangement will be incorporated.

Exclusive: first view of McDonnell utility jet



AIR FORCE Source Selection Board has completed evaluation of McDonnell Model 119 utility jet, shown in artist's concept (above), and Lockheed JetStar in its off-the-shelf utility jet program. Report to Air Staff is due about April 21. Current specifications on McDonnell entry have not been made public. Powerplants will be four General Electric J85s or Fairchild J83s.

Big assist for small airlines: Capital gains bill clears Congress

After more than two years of argument, setbacks and revision, backers of airline capital gains legislation last week watched their handiwork start the final leg of its journey—to the President's desk.

Capital gains supporters in the House, turning back determined opponents, pushed the measure close to enactment. On a roll call vote the House endorsed a compromise version by 276 to 63. President Eisenhower is expected to sign the bill.

The measure is designed to aid the re-equipment of smaller airlines. It would allow subsidized lines to apply the proceeds of sales of surplus aircraft to new equipment without having the gains offset against subsidy needs.

Senate amendments accepted by the House will:

Authorize features of the bill to apply to aircraft delivered since April 6, 1956.

Bar the CAB from reimbursing capital losses from subsidy reserves.

In approving the measure, Congress gave CAB the authority the Board has said it must have to rule on capital gains for subsidized carriers. The CAB, after much soul-searching, recently concluded it lacked the statutory power. Congress has now given it to the Board.

With this power goes the duty of riding herd on applicants. CAB must make certain that an eligible carrier:

Notifies the Board in writing that it has invested or intends to reinvest

the gains earned from a sale in new flight equipment.

Produces evidence that an amount equal to such gains has been spent for flight equipment or has been deposited in a special CAB re-equipment fund.

BRIEFS

Britain's Napier Eland N.E1.6 turboprop engine has passed a 150-hour type test at a sea-level takeoff rating of 3,500 ehp under joint ARB/CAA conditions.

CAA has certificated Smith-AEF Super C-46C developed by L. B. Smith Aircraft Corp. and Aircraft Engineering Foundation. Type certificate SA2-422 lists maximum gross at 50,100 lbs.

TWA is giving its Lockheed L-049 Constellation fleet reverse thrust capability with installation of a propeller system control assembly developed by Hamilton Standard.

American Airlines has ordered 400-cycle aircraft ground power units to support jet aircraft. Manufacturer is Motor Generator Corp., Troy, Ohio.

CAB has renewed Los Angeles Airways' certificate to operate helicopter routes in the Los Angeles area. New expiration date is Dec. 31, 1964.

Pan American World Airways ordered five special test stands from George L. Nankervis Co., Detroit, for overhaul work on jet transports.

National Airlines has ordered nearly half a million dollars in com-

Forecast: coast-to-coast flights in 28 minutes

Commercial airliners using rocket power will, in the not-too-distant future, make transcontinental flights in 28 minutes from takeoff to landing pattern, J. M. Cumming of Rocketdyne, has predicted. Military applications of rocket aircraft would precede commercial, he said.

Speaking at the American Society of Mechanical Engineers-American Rocket Society meeting in Dallas, Cumming said the aircraft would combine liquid-propellant rocket power and conventional turbojet engines.

munications/navigation equipment from Bendix Radio Div. for use in its Lockheed Electra fleet. First delivery is slated this month with installation to be made at the Lockheed Burbank plant.

With the recent sale of 17,000 shares of Eastern Air Lines common stock, board chairman E. V. Rickenbacker's holdings were reduced to 43,173 shares. Rickenbacker at the beginning of the year held 106,000 shares of EAL common. He disposed of 46,000 shares to an unnamed investor, stating only that he made the sale because of "personal commitments."

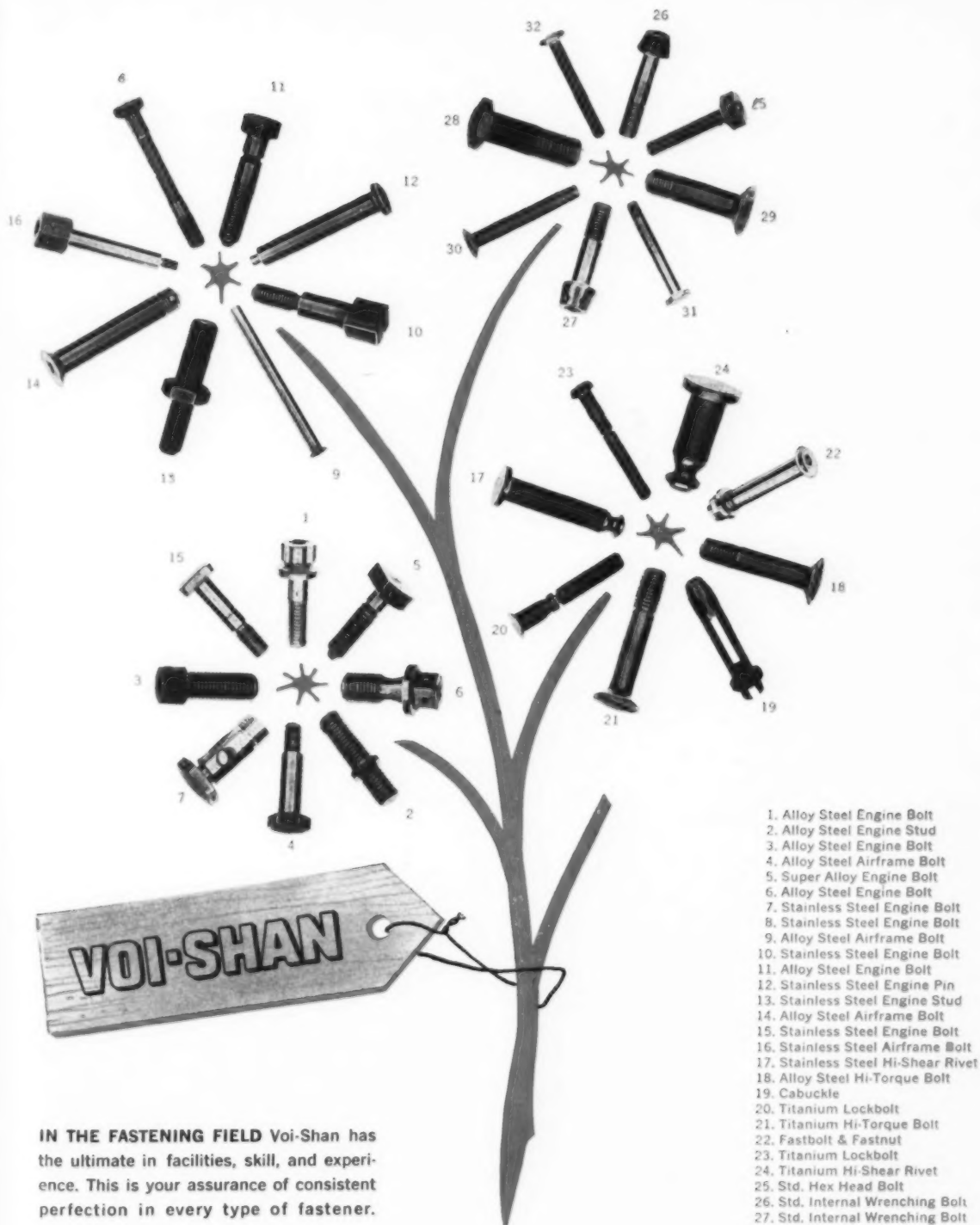
Trans Caribbean Airways has been elected to the Air Transport Assn. and to associate membership in the International Air Transport Assn. Airline has been awarded a five-year passenger-cargo certificate by CAB for the New York-San Juan run.

Turboprop F-27 in airline colors marks Fokker milestone



FIRST PRODUCTION Fokker F-27 Friendship made its initial flight late last month from Amsterdam-Schiphol Airport. Plane carried markings of Aer Lingus, Irish airline, and will be delivered by October. Airline has seven on order. F-27 is first Fokker design to carry an airline's colors in 25 years. Last was the Fokker Trimotor.

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14. Alloy Steel Airframe Bolt
15. Stainless Steel Engine Bolt
16. Stainless Steel Airframe Bolt
17. Stainless Steel Hi-Shear Rivet
18. Alloy Steel Hi-Torque Bolt
19. Cabuckle
20. Titanium Lockbolt
21. Titanium Hi-Torque Bolt
22. Fastbolt & Fastnut
23. Titanium Lockbolt
24. Titanium Hi-Shear Rivet
25. Std. Hex Head Bolt
26. Std. Internal Wrenching Bolt
27. Std. Internal Wrenching Bolt
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WEST COAST TALK

by Fred S. Hunter

Watch that fine print, Strategic Industries Assn. warns its members; anything can happen

FIRMS BELONGING to the Strategic Industries Assn. have been warned to watch the "fine print" on purchase order forms for rights in data clauses. This is another phase of the military invasion of proprietary rights. Design data is obtained from a fixed-price supplier of a proprietary item, and then, for "governmental purposes," the item is made either in the prime plant or elsewhere. Prime contractors have their own patent problems. But SAI members are of the opinion the larger companies are more protected by the very size of their projects, and say violations of proprietary rights actually are more damaging to small and independent firms.

Anything can happen around an airport, but Los Angeles International Airport officials were more than a little surprised recently when six passengers on a Western Air Lines plane filed damage claims against the airport because of rough air experienced en route on the flight from Las Vegas. The turbulence took place in the area of Ontario, but the passengers—filing one claim for \$55,000, one for \$50,000, three for \$25,000 each and one for \$20,000—contended the Los Angeles airport, as well as WAL, was negligent.

When visitors tour Rohr Aircraft Corp.'s Riverside plant, they put on safety glasses. This is not because Rohr's management thinks there is any danger of a flying fragment popping into the optic of a walk-by visitor going through the plant. It is for the psychological effect upon workers. All employees located in the main plant at Riverside are required to wear safety glasses and C. E. Barnes, vice president and plant manager, doesn't want them to see anybody else moving around the factory without them. Rohr-Riverside, it might be added, has 14 or 15 members of the "Wise Owls," workers who avoided an eye injury through the use of safety glasses.

Lockheed has proposed an unmanned aircraft version of the F-104 to the Air Force. Take out the weight of the pilot, the ejection seat, and the landing gear, and the already high-performance fighter F-104 can be turned into a higher-performance pilotless aircraft. Combining a manned and unmanned aircraft also has economy ad-

vantages. Development costs would be shared.

North American, says Test Pilot Scott Crossfield, has contrived a very comfortable cockpit for the X-15, which is something new for research planes . . . The Douglas A4D-N2 incorporates the new electronic navigation system . . . Lockheed's tentative price for the JetStar is \$1 million, but it might be cut to around \$750,000, if the military places a big enough order.

Mechanics working in the big \$8-million maintenance and modification hangar at Edwards AFB have discovered that, when conditions are just right, opening a set of the electrically operated doors will cause a pressure change that manufactures a "boom" similar to a healthy sonic boom from a supersonic jet aloft.

Capt. Karl M. Ruppenthal, San Francisco-based TWA pilot, who is a city councilman of Palo Alto on the side, has taken an eight-months' leave of absence to accept a doctoral fellowship from the Alfred P. Sloan Foundation at Stanford University. He holds a master's degree from the University of California.

Aircraft cutbacks are resulting in higher costs because of smaller quantity buying. William R. Whittaker, for example, told Telecomputing stockholders at the recent annual meeting that the Whittaker Controls division is making fewer valves, but charging higher prices for them . . . North American President J. L. Atwood told stockholders at the annual meeting that the B-70 chemical bomber will be protected by countermeasures that are "unbelievable."

Telecomputing Corp. is acquiring a 77-acre site in the San Francisco Valley, where it plans to construct a \$5-million plant to house its various divisions, now separated in different areas of Los Angeles.

Phase VI testing crew at Edwards AFB flew a Douglas C-133A from California to Lajes field in the Azores to demonstrate the maximum gross weight crosswind takeoff and landing capabilities of the big turboprop. Lajes was picked for this mission because it reportedly experiences the strongest crosswinds of any field where C-133s must land.

SIDELIGHTS

Yeah, which one? . . . Roy Pryor, General Electric test pilot at Edwards AFB, tells the story. Herman (Fish) Salmon, Lockheed's chief engineering test pilot, was flying an F-104A over the Mojave Desert north of Edwards when the base asked his position. He duly reported it. Minutes after, when the tower checked again, Salmon said he had passed over the base and was out over the ocean. Said the man in the tower: "Which ocean?"

Cosmopolitan and democratic . . . First Air Force group to fly Lockheed F-104s operationally, the 83rd Fighter Squadron at Hamilton AFB is a cosmopolitan outfit. Its four pilots are a British RAF squadron leader on exchange, a Navy lieutenant also on exchange, a senior USAF captain and an Air Force Negro captain.

No more coasting . . . Buyers can't coast on high school mathematics backgrounds any more, says Howard G. Golem, director of procurement for Convair. Education must be continuous for buyers dealing with such complexities as exotic fuels, transistors, inverter filters and many things which haven't yet been built, but have to be procured through R&D contracts.

'Miss DC-8' in making . . . Pretty soon you'll be seeing pictures of "Miss DC-8" in the papers and on television. A contest is under way at Douglas-Long Beach where employees will pick the winner by ballot.

Hah! . . . Overheard recently at one aircraft manufacturing plant in the throes of recent cutback reorganization: "If my boss calls, get his name."

Neutral subject . . . Here's a switch. Speaker at a recent meeting of the Douglas-El Segundo Management Club was B. F. Coggan, v.p. of Convair-San Diego. Subject of his talk, though, was neutral—"Management, Inc."

Beer, anyone? . . . North Central Airlines may soon join the ranks of those airlines with "special name" service. But it won't be as fancy as Red Carpet, Ambassador, Imperial, etc. The company, which operates through the brewing center of Milwaukee, is considering "Beer Flights" on some of its routes. Several breweries have expressed interest in furnishing the beverage gratis for serving to North Central passengers.

Deal that paid off . . . Major C. C. Moseley is an even more legendary figure now in the aviation business than ever. Not everything he's handled in the past has turned to gold, but he's always managed to keep well ahead on the net gain. His real coup came, however, when a few years ago he set up Grand Central Rocket Co. with Charles E. Bartley, university professor, as president. Company has now been sold at a fancy figure to Tennessee Gas Transmission Co. and both Moseley and Bartley, who held a chunk of the stock, came out way ahead financially. Millionaires after taxes, so it is said.

Industry talk . . . Successful bidder for an F-51D at recent Air Force surplus sale was Al's Laundry, Ontario, Calif. To speed up deliveries, no doubt. . . . **To most folks**, OSS stands for the Office of Strategic Services, cloak-and-dagger outfit of World War II, but at the Air Force's Directorate of Flight Safety Research it stands for Operations Safety Survey. Its teams, instead of being undercover workers, bring to light accident-inducing hazards.

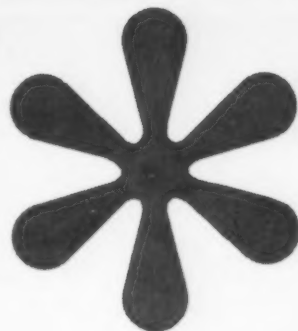
Disarming frankness . . . Heard in a Pentagon corridor was this latest version of the "oldest profession" story. A doctor, an engineer and a Defense Dept. official were arguing. The doctor said surgery is the oldest profession, since Eve was made from the rib of Adam.

"Oh no," objected the engineer, "God created the heavens and earth out of chaos. That was an engineering job."

"And who," asked the Defense man, "do you think created chaos?"

'Operation Hospitality' . . . John A. (Jack) Smith, special assistant for government affairs for Continental Air Lines, scored a big hit with "Operation Hospitality" which he conceived in Denver. On Sunday, Feb. 9, folks from the six airlines serving the city invited into their homes for a family feed the cadets from the USAF Academy at Lowry Field. Two cadets per household. Worked out fine. Will be annual.

What? Not king-sized? . . . The industry has heard some weird comparisons in the past 50 years, but this latest describing a new fighter stands close to the top: "Able to climb from ground to stratospheric heights in less time than it takes to smoke one-seventh of a regular cigarette."



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Exclusive: Southwest Airmotive's \$4-million business aircraft facility

DALLAS—Latest development in Southwest Airmotive Co.'s \$4-million construction program at Love Field is the luxurious business flying terminal and service facility shown here.

Previously completed were three large hangars, with two more nearly ready. A sixth will be started by mid-year.

These new structures are in addition to the company's jet overhaul facilities and distributor sales division, also located on Love Field, and its jet engine testing plant near Ft. Worth.

"There are about 600 business aircraft in the Dallas area," Winston Castleberry, Southwest executive vp, says in explaining the company's expansion program. "We hope to get about 200 of them for service and storage."

New two-story terminal serves an average of 30 transient planes a day. The Flight Deck restaurant serves several hundred persons daily.

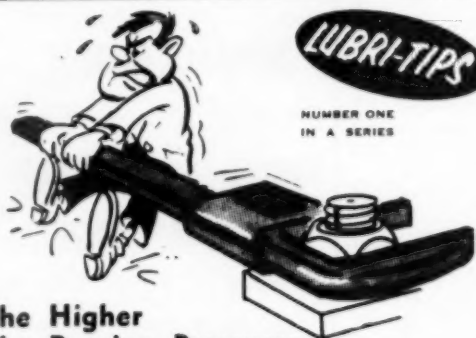
The air-conditioned building cost about \$250,000. First floor includes a large lobby, operations room with direct lines to Dallas Radio, crew rooms,

private office and lounge for visiting VIPs and the company's offices. Second floor is occupied by the restaurant.

Southwest's flight ramp covers 11 acres. Car parking is provided behind the building.

When the "master plan" for the new facilities is completed late this year, Castleberry says a formal opening celebration will be held.

Southwest now employs more than 800, has a payroll in excess of \$3 million and grossed \$11 million in business last year.



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EN ROUTE

by Wayne W. Parrish

Night flight to New Zealand—land of the 'shammy'

FOR REASONS I can scarcely justify to myself since I'm presumed to know better, I let myself get booked on a night flight from Australia to New Zealand. To be frank about it, I didn't know there was a daily daytime schedule; by the time I discovered this, it was too late.

Departure from Sydney was 1:30 a.m. on a DC-6 of TEAL—Tasman Empire Airways Ltd. Scheduled flight time to Auckland, N.Z. was five hours. When we took off, announcement was made that the flight time would be five and a half hours. Halfway across the Tasman Sea the time was cut down to four and a half. And at what seemed an awful early hour, unnecessarily far in advance of arrival, the lights went on and breakfast was served. It was still dark outside. Sleeping time was next to nothing.

TEAL has more bosses than a government clerk. It is owned by the New Zealand and Australian governments through New Zealand National Airways Corp. (government owned) and Qantas Empire Airways (government) and, what with the tugging of governments and national interests and foreign policies and other factors, the airline has done pretty well to survive.

As a matter of fact, TEAL has had quite a distinguished history and I am proud to say that I was one of its customers in the World War II days of 1944 when I flew from Rose Bay, Sydney, to Auckland, in a Short Brothers flying boat. It gave up the boats many years ago and now uses landplanes for an impressive number of flights per week between the two countries. But TEAL continues to use flying boats on its every-other-week service from the Fiji Islands to Tahiti, which reminds me that it's high time I paid a formal call on that last-named place.

I can assure you that if I ever make the trip over the Tasman Sea again it's going to be by day. I arrived in Auckland so sleepy I didn't see how I'd get through the day.

But my reception committee of one at Auckland was enough to wake me up. The committee consisted of a very wonderful bloke by the name of Leo White. I consider him one of God's own particular favorites. I met him back in 1944 and hadn't seen him since, but we've corresponded and, when I met him again, it was as though I had been away for no more than a week.

Leo had appointed himself my official host for a hectic three-day whirlwind visit of New Zealand. The time was much too short but I didn't see how I could have packed in much more in two weeks.

Leo White is "Mr. Aviation" in New Zealand and I'm sure that every airline

man and every pilot in that fine little country would concur. He is editor and publisher of *Whites Aviation*, a monthly magazine that everybody in aviation reads down there, but that's only the beginning of his many enterprises. He runs a big photographic studio, specializing in aerial photos, and he's got some photo-murals of New Zealand scenery that match the best that Switzerland can provide. But he also runs a travel bureau and—well, if you want to travel, if you want photos, or if you want to know anything whatever about aviation—just ask Leo White, Whites Aviation, Dilworth Building, Auckland, N.Z.

I had alerted Leo to my coming and I made just three major requests besides seeing him. One was to pay a visit to SAFE, Straits Air Freight Express, which flies railway cargo between the two main islands of New Zealand. The other was a long-time ambition to fly to the extreme southern end of the south island to a town with the picturesque and inviting name of Invercargill. How many times I had looked on my world map and seen that name! I had to get there if I walked. The third request was to pay my respects to Sir Leonard Isitt, now chairman of N.Z. National Airways Corp., whom I had met as a general in World War II.

Well, as I say, the TEAL DC-6 pulled up at Whenuapai Airport at Auckland (they really have some bone-crushing names down there) and there was Leo all smiles as I came down the steps. After I got through immigration and customs, Leo handed me my itinerary, all made out in great detail with exact times, flight numbers, appointments and so forth, with notation that copies had been distributed up and down the line to all concerned. An Eisenhower tour was never arranged more efficiently. I felt like a VIP instead of a roving journalist with a cockeyed penchant for getting to such faraway places as Invercargill.

Whenuapai Airport has a very nice terminal, modern in motif, snack bar and ample seating room.

I left my bags at the airport and went into town with Leo, first to his house where I had a bath, shave and a good second cup of coffee. Then we drove around the town, which has been expanding quite a bit, and dropped in at his office in the Dilworth Building, same spot he had in 1944. Miss Desna Douglas, an attractive gal who edits his magazine, was there to meet me, and I looked over some of the fine collection of photo murals which Leo has taken.

And right after that I performed one of only two shopping instructions my better half had given to me before leaving the U.S. That was to buy some real "shammy" skins. They come from New Zealand and there's nothing like

the genuine article. Leo thought he knew everything about his country until I said I had come a good many thousands of miles to make a purchase. Know what they are? A shammy (or chammy) skin is a soft, pliant leather prepared from the skin of the chamois, which is a small goatlike antelope. Fine for wiping windows. I guess they come from Europe, too, but the New Zealand product is known for its high quality. (My better half was pleased that I had remembered the instructions—I so often forget.)

It was then noon, and I was rocking from loss of sleep, but we went to a hotel to have lunch with the board of directors of TEAL and I had the pleasure of sitting between the two top men of aviation "down under"—Sir Leonard Isitt and Sir Hudson Fysh, chairman of Qantas. Geoffrey Roberts, managing director of TEAL, and the other directors were on hand.

Another old friend, Robbie Robertson, who was associated with TEAL back in 1944 and is now in other work, took me over after the lunch to drive me to the airport for my 3:15 p.m. flight south to Wellington, capital of the country. In a little less than two hours I was on Paraparaumu Airport (try to pronounce that one) and met by D. A. Patterson of National Airways and driven the long 30 miles into the city.

I checked in at the Hotel Waterloo, where I had stayed in 1944, and went straight to bed. And just as I was about to doze off (it was still light) E. A. Gibson, former director of civil aviation, was on the phone wanting to take me to dinner. With profuse apologies I begged off, and hit the sack, dead to the world. I had kept going strong for three or four weeks straight but exhaustion finally overtook me. I wanted to do nothing but sleep.

Coming Event

You readers of this page who watch the Ed Murrow CBS-TV program *Person to Person*—and who doesn't?—who would care to see a short, pudgy, smug bloke whose initials are W.W.P., known as the Poor Man's Lowell Thomas, perform before the cameras are advised that Mr. Murrow will originate half of his program Friday night, April 18, from the home of Mr. and Mrs. Wayne W. Parrish in Washington. (Mrs. Parrish is Miss Frances Knight, director of the Passport Office of the Department of State.) So tune in CBS-TV. Even if you get bored with the Parrish portion, you'll be recompensed by Maurice Chevalier, the French star, featured during the same half hour.



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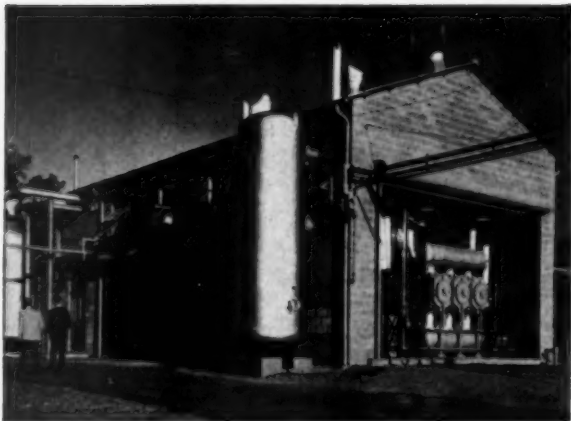
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